C 41.21 : 41/3

PAMPHLET FILE
MIAMI UNIV. LIB.

February 5, 1966

# U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS

MAR - 7 1966

*Semi-Monthly Journal*

- *Abstracts of R & D Reports*
- *List of Current R & D Projects*
- *Indexes*

MIAMI UNIVERSITY LIBRARY

**CLEARINGHOUSE**
FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

*February 5, 1966 / Volume 41, Number 3*

*U.S. Government*

# RESEARCH AND DEVELOPMENT REPORTS

*Issued twice a month by the Clearinghouse for Federal Scientific and Technical Information. Annual subscription $15 ($3.75 additional for foreign mailing). Single copy $1. Make remittance payable to Superintendent of Documents and mail either to a U.S. Department of Commerce Field Office or to Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. Address changes should be sent to Superintendent of Documents.*

## PURPOSE

*U.S. Government Research & Development Reports* announces the availability of new reports of U.S. Government-sponsored R&D released by the Department of Defense, the Atomic Energy Commission, National Aeronautics & Space Administration, and other agencies. It also lists current Government-sponsored R&D projects.

## TO ORDER REPORTS

Reports announced herein are available to the public from the Clearinghouse, or in some cases from other sources as noted. Order reports by accession/report (Stock Number) given on the first line of each entry and title from the Clearinghouse, U. S. Department of Commerce, Springfield, Va. 22151, or from any Department of Commerce Field Office (listed on inside back cover). Prices for hard copy (HC) and microfiche copy (MF) are given in the entry. Prepayment is required unless purchases are to be charged to Clearinghouse deposit accounts. Order forms are provided at the back of this journal. Make check or money order payable to National Bureau of Standards—CFSTI.

## OTHER JOURNALS

NASA and AEC documents announced in this publication are also abstracted—along with other mission-oriented material—in the NASA journal *Scientific and Technical Aerospace Reports,* and the AEC journal *Nuclear Science Abstracts.* These publications are sold on subscription by Superintendent of Documents: *STAR* at $33 a year ($9 additional for foreign mailing); *NSA* at $30 a year ($7 additional for foreign mailing).

A consolidated index, *Government-Wide Index to Federal Research & Development Reports,* is published monthly by the Clearinghouse, using indexing data from *U.S. Government Research & Development Reports, Scientific and Technical Aerospace Reports,* and *Nuclear Science Abstracts.* It is sold by Superintendent of Documents at $16 a year ($4 additional for foreign mailing).

U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary

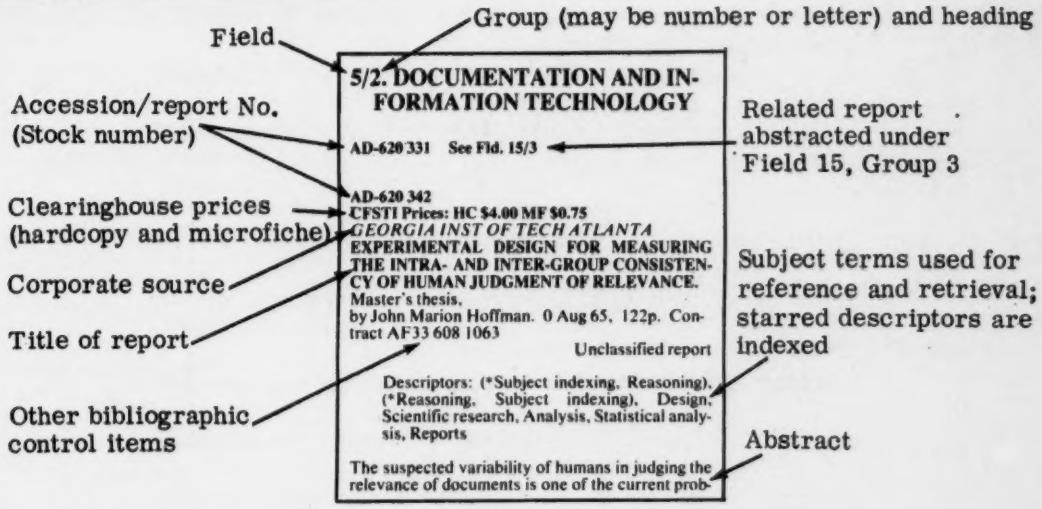
CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION
Springfield, Va. 22151
Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated. Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

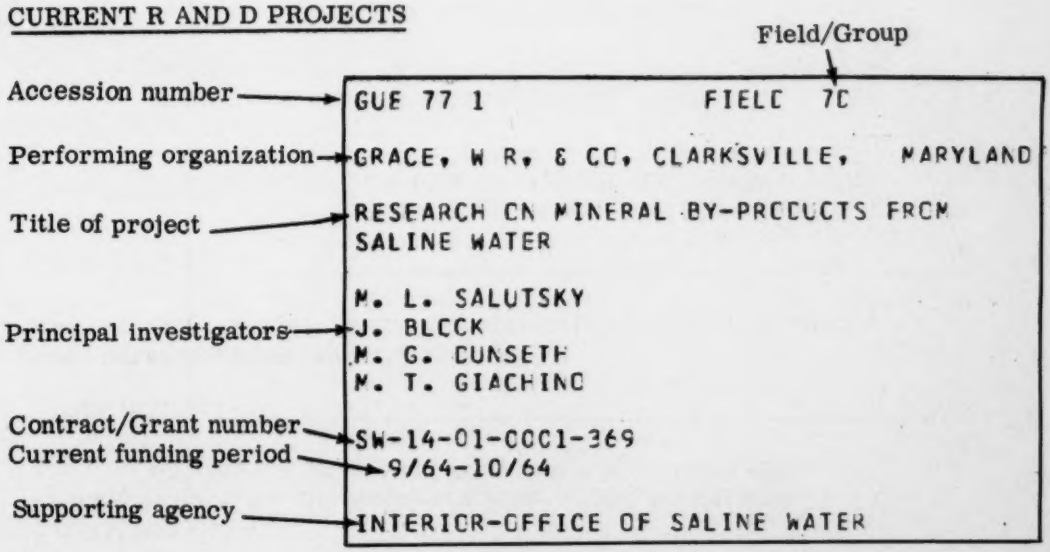
# HOW TO USE
# U S G R D R

Entries are arranged under 22 subject categories called FIELDS. In the "Technical Abstract Bulletin" section, FIELDS are divided into sub-categories called GROUPS and occasionally subgroupings are also used. Documents are listed alpha-numerically (that is, alphabetic data precedes numerical data) by accession/report number. Although differing slightly in printing format, entries in the various sections contain essentially the same information.

- TECHNICAL ABSTRACT BULLETIN
- OTHER RESEARCH REPORTS


Field
Group (may be number or letter) and heading
5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY
Accession/report No. (Stock number)
AD-620 331 See Fld. 15/3
Related report abstracted under Field 15, Group 3
AD-620 342
Clearinghouse prices (hardcopy and microfiche)
CFSTI Prices: HC $4.00 MF $0.75
Corporate source
GEORGIA INST OF TECH ATLANTA
Title of report
EXPERIMENTAL DESIGN FOR MEASURING THE INTRA- AND INTER-GROUP CONSISTENCY OF HUMAN JUDGMENT OF RELEVANCE.
Master's thesis,
by John Marion Hoffman. 0 Aug 65, 122p. Contract AF33 608 1063
Unclassified report
Subject terms used for reference and retrieval; starred descriptors are indexed
Other bibliographic control items
Descriptors: (*Subject indexing, Reasoning), (*Reasoning, Subject indexing), Design, Scientific research, Analysis, Statistical analysis, Reports
Abstract
The suspected variability of humans in judging the relevance of documents is one of the current prob-

- CURRENT R AND D PROJECTS




799-657 O - 66 A

# CONTENTS


| | | Page |
|---|---|---|
| Section I | RESEARCH HIGHLIGHTS ..... | vii |
| | Reports of current high industrial interest | |
| Section II | CURRENT RESEARCH AND DEVELOPMENT PROJECTS ..... | xiii |
| | Listing of current Federally supported R and D projects | |
| Section III | TECHNICAL ABSTRACT BULLETIN (TAB) ..... | 1 |
| | Department of Defense reports released by Defense Documentation Center | |
| | Citations of various articles in non-Government journals | |
| | Selected Government Printing Office publications | |
| | Indexes--Subject, Personal Author, Corporate Author-Monitoring Agency, Contract Number, Report Number, AD-Field | |
| Section IV | OTHER RESEARCH REPORTS AND RELATED MATERIAL ..... | S-1 |
| | Atomic Energy Commission reports including engineering (CAPE) drawings | |
| | National Aeronautics and Space Administration reports | |
| | Other civilian agency reports | |
| | Government-owned patents | |
| | Military reports previously classified or limited | |
| | Indexes--Subject, Personal Author, Corporate Source, Contract Number, Accession/Report Number | |


SUBJECT CATEGORY HEADINGS


| | | |
|---|---|---|
| 01 | AERONAUTICS ..... | 1, S-1 |
| | Includes aerodynamics; aeronautics; aircraft; aircraft flight control and instrumentation; and air facilities. | |
| 02 | AGRICULTURE ..... | 2 |
| | Includes agricultural chemistry; agricultural economics; agricultural engineering; agronomy and horticulture; animal husbandry; and forestry. | |

| | | Page |
|---|---|---|
| 03 | ASTRONOMY AND ASTROPHYSICS | 2, S-3 |
| | Includes astronomy; astrophysics; and celestial mechanics. | |
| 04 | ATMOSPHERIC SCIENCES | 3, S-4 |
| | Includes atmospheric physics and meteorology. | |
| 05 | BEHAVIORAL AND SOCIAL SCIENCES | 7, S-7 |
| | Includes administration and management; documentation and information technology; economics; history, law and political science; human factors engineering; humanities; linguistics; man-machine relations; personnel selection, training, and evaluation; psychology (individual and group behavior); and sociology. | |
| 06 | BIOLOGICAL AND MEDICAL SCIENCES | 16, S-10 |
| | Includes biochemistry; bioengineering; biology; bionics; clinical medicine; environmental biology; escape, rescue, and survival; food; hygiene and sanitation; industrial (occupational) medicine; life support; medical and hospital equipment and supplies; microbiology; personnel selection and maintenance (medical); pharmacology; physiology; protective equipment; radiobiology; stress physiology; toxicology; and weapon effects. | |
| 07 | CHEMISTRY | 27, S-13 |
| | Includes chemical engineering; inorganic chemistry; organic chemistry; physical chemistry; and radio and radiation chemistry. | |
| 08 | EARTH SCIENCES AND OCEANOGRAPHY | 38, S-14 |
| | Includes biological oceanography; cartography; dynamic oceanography; geochemistry; geodesy; geography; geology and mineralogy; hydrology and limnology; mining engineering; physical oceanography; seismology; snow, ice, and permafrost; soil mechanics; and terrestrial magnetism. | |
| 09 | ELECTRONICS AND ELECTRICAL ENGINEERING | 43, S-19 |
| | Includes components; computers; electronic and electrical engineering; information theory; subsystems; and telemetry. | |
| 10 | ENERGY CONVERSION (Non-Propulsive) | 52, S-26 |
| | Includes conversion techniques; power sources; and energy storage. | |

Page

11 MATERIALS ..... 53, S-27

Includes adhesives and seals; ceramics, refractories, and glasses; coatings, colorants, and finishes; composite materials; fibers and textiles; metallurgy and metallography; miscellaneous materials; oils, lubricants, and hydraulic fluids; plastics; rubbers; solvents, cleaners, and abrasives; and wood and paper products.

12 MATHEMATICAL SCIENCES ..... 60, S-34

Includes mathematics and statistics and operations research.

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING ..... 64, S-35

Includes air conditioning, heating, lighting, and ventilating; civil engineering; construction equipment, materials, and supplies; containers and packaging; couplings, fittings, fasteners, and joints; ground transportation equipment; hydraulic and pneumatic equipment; industrial processes; machinery and tools; marine engineering; pumps, filters, pipes, tubing, fittings, and valves; safety engineering; and structural engineering.

14 METHODS AND EQUIPMENT ..... 70, S-40

Includes cost effectiveness; laboratories, test facilities, and test equipment; recording devices; reliability; and reprography.

15 MILITARY SCIENCES ..... 73

Includes antisubmarine warfare; chemical, biological, and radiological warfare; defense; intelligence; logistics; nuclear warfare; and operations, strategy, and tactics.

16 MISSILE TECHNOLOGY ..... 74, S-42

Includes missile launching and ground support; missile trajectories; missile warheads and fuzes; and missiles.

17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES ..... 74, S-43

Includes acoustic detection; communications; direction finding; electromagnetic and acoustic countermeasures; infrared and ultraviolet detection; magnetic detection; navigation and guidance; optical detection; radar detection; and seismic detection.

18 NUCLEAR SCIENCE AND TECHNOLOGY ..... 77, S-44

Includes fusion devices (thermonuclear); isotopes; nuclear explosions; nuclear instrumentation; nuclear power plants; radiation shielding and protection; radioactive wastes and fission products; radioactivity; reactor engineering and operation; reactor materials; reactor physics; reactors (power); reactors (non-power); and SNAP technology.

Page

19 ORDNANCE ..... 79, S-48

Includes ammunition, explosives; bombs; combat vehicles; explosions, ballistics, and armor; fire control and bombing systems; guns; rockets; and underwater ordnance.

20 PHYSICS ..... 80, S-49

Includes acoustics; crystallography; electricity and magnetism; fluid mechanics; masers and lasers; optics; particle accelerators; particle physics; plasma physics; quantum theory; solid-mechanics; solid-state physics; thermodynamics and wave propagation.

21 PROPULSION AND FUELS ..... 100, S-55

Includes air-breathing engines; combustion and ignition.

22 SPACE TECHNOLOGY ..... 103, S-57

Includes astronautics; spacecraft; spacecraft trajectories and reentry; and spacecraft launch vehicles and ground support.

# RESEARCH highlights

*Reports of current high industrial interest*

## Categories


| | Page |
|---|---|
| Electronics | vii |
| Coatings | viii |
| Engineering and Construction | viii |
| Human Factors Engineering | viii |
| Information Technology | ix |
| Nuclear Technology | ix |
| Metalworking and Metal Forming | x |
| Metals, Non-Ferrous and Alloys | x |
| Semiconductors and Related Materials | x |
| Wood and Paper | xi |
| Food Processing | xi |


## Electronics

### LATEST REPORT IN SILICON DEVICE SERIES COVERS EPITAXY

(Order Stock No. AD-624 520 Integrated Silicon Device Technology, Vol. 9, Epitaxy, HC $5.00/MF $1.00.)

"Epitaxy," the latest in a series of reports on silicon integrated device technology, is now available. Prepared by Research Triangle Institute as an aid to design and process engineers, the report discusses the theory, growth techniques, and practical application of silicon epitaxy to device structures. In the epitaxy process a gas containing silicon atoms is suitably passed over the substrate until the atoms are positioned and become part of the growing film. Under proper conditions single crystal orientation is obtained and the resulting layer is an exact extension of the single crystal substrate as shown by electron diffraction. Epitaxy eliminates many of the compromises that were previously necessary in the fabrication of integrated circuits. Individual device characteristics are greatly improved and circuit isolation techniques have been optimized and simplified through the use of epitaxy. As a result, the reliability, cost and yield of integrated circuits have been greatly improved.

## Coatings

### ACCELERATED TESTING OF ORGANIC COATINGS

(Order Stock No. SC-TM-64-995 Superior Organic Coatings, HC $1.00/MF $0.50.)

An immediate check on organic paint quality can be made using a new nondestructive accelerated test developed for the AEC by Sandia Corp. The test also provides a means by which laboratory analysis of organic coatings or different quality levels of organic coatings may be greatly expedited. The accelerated test involves application of steam to a 2-inch diameter test area at a specific pressure for a short specified period of time. The technique indicates the ability of an organic coating to resist the degrading action of high humidity. Paint systems which have proved satisfactory in extended exposure to high humidity environments will easily resist 10 psig steam for 5 minutes without visible degradation.

## Engineering and Construction

### HIGHWAY CONFERENCE FOCUSED ON ASPHALT

(Order Stock No. PB-168 677 Proceedings, Highway Conference on Research and Development of Quality Control and Acceptance Specifications Using Advanced Technology, HC $8.20/MF $2.25; Volume Two: Asphalt Technology, Stock No. PB-168 678, HC $6.00/MF $1.25.)

The Proceedings of the 1965 Highway Conference on Research and Development of Quality Control and Acceptance Specifications sponsored by the Bureau of Public Roads, U. S. Department of Commerce, focused on the development of a statistical approach to quality control in highway construction and maintenance; reexamination of the basic properties of materials; and development of rapid nondestructive tests for acceptance of contractors' performance. Conferees also examined the need for nationally coordinated research and development on asphalt; looked into properties of asphalt to be controlled for optimum specifications; and reviewed the status of fundamental research on chemical properties of asphalt.

## Human Factors Engineering

### MODIFYING ENVIRONMENT TO IMPROVE HUMAN PERFORMANCE

(Order Stock No. AD-623 637 Time and Accuracy as Measures of Human Performance, HC $1.00/MF $0.50.)

How environment modification affects human performance is reviewed by the Navy from three approaches: providing normal environment, providing protective devices against changes from the normal environment, and adapting man to changes from the normal environment. All approaches are present to some degree in man's endeavors in space, oceanography, and polar exploration -- to name just three recent

pursuits. The Navy study allows fuller appreciation of the contributions of each environment and the requirements for consideration of the total picture. It is a review of the established limits of many factors as a guide toward presenting optimum conditions for man's performance.

## Information Technology

### ON-LINE DATA STORAGE AND RETRIEVAL

(Order Stock No. AD-623 796 An Experimental On-Line Data Storage and Retrieval System, HC $2.00/MF $0.50.)

An on-line data storage and retrieval system developed for the Air Force by MIT's Lincoln Laboratory can test and demonstrate on-line storage and retrieval of formatted data based on complete internal descriptions of the files. The use of internal descriptions allows each user (who need not be a trained programmer) to define, modify, and cross-associate data files to suit his particular needs. Developers implemented the system by remote use of the compatible time-sharing system at MIT. They say the file set can contain many files, each having its own content and logical organization. In addition, the user can redefine or modify files on-line, using ordinary English commands and referring to all files or parts of files by name. The user never need be concerned about the length of the files and can establish relations between files or parts of files. The system detects many frequent clerical errors such as misspellings or incorrect file identification and permits the user to make corrections immediately.

## Nuclear Technology

### URANIUM CARBIDE TECHNOLOGY ADVANCED

(Order Stock No. NAA-SR-10929 The Nature and Properties of Carbides of Uranium, HC $3.00.)

Uranium carbide technology has reached the point of practical demonstration in operating power reactors. In sodium-cooled graphite-moderated reactors, carbide fuel-element performance has been entirely satisfactory, according to Atomics International in an evaluation of the literature for AEC. Their report summarizes information on the preparation and physical and mechanical properties of UC and its fabrication and compatibility with cladding materials. UC offers the advantages of high melting point and good stability under irradiation with no dimensional changes resulting from phase transformations. In addition, the high thermal conductivity of UC (3 to 7 times that of $UO_2$ depending on operating temperature) and its greater uranium density relative to that of $UO_2$ (in the ratio of 12.96 to 9.6) make uranium monocarbide singularly attractive for high efficiency power reactors designed to operate at elevated temperature and at high specific power. Burnups of the order of 25,000 Mwd/MTU have been obtained in irradiations reproducing reactor design conditions, and values at the level of 45,000 Mwd/MTU have been reached in capsule experiments.

## Metalworking and Metal Forming

### ANISOTROPY AND CRYSTALLOGRAPHIC STRUCTURE

(Order Stock No. AD-620 029 Interrelationship Between Anisotropy and Crystallographic Structure, HC $1.00/MF $0.50.)

One of the most influential factors in determining the drawability of a metal is its mechanical anisotropy, the Army Materials Research Agency says. The variations in normal and planar anisotropy in rolled metal products are functions of crystallographic structure. The mechanical anisotropy of a material is shown by variations in mechanical properties with test direction. Conversely, if a material has uniform properties in all directions, it is isotropic. High normal anisotropy is desirable especially in symmetrical parts such as rocket motor cases because it adds strength to resist thinning. In contrast, a large amount of planar anisotropy is undesirable since it is a direct cause of earing which, if severe enough, can result in cracking of the deep drawn part. Data are given from AMRA studies and a review of the literature relating the strain ratio measured at an angle to the principal rolling direction of that angle.

## Metals, Non-Ferrous and Alloys

### FRACTOGRAPHY OF OVER 300 ALLOYS

(Order Stock No. AD-612 912 Electron Fractography Handbook, HC $12.10/MF $3.75.)

A handbook on electron microscope fractography has been compiled that involved the testing of over 300 specimen alloys with failures under a wide range of known environmental conditions. Prepared by Douglas Aircraft for the Air Force Materials Laboratory, the handbook contains fine-screen electron fractographs of alloys of primary interest to the aerospace industry. These include aluminum, beryllium, magnesium, titanium, steel, nickel, niobium, and molybdenum base alloys. Although the primary purpose of the handbook is to assist in determining service failure causes, it has a much wider range of application. Much of the information will be of value to the student and to the metallurgist in understanding some of the mechanisms of metal failure. According to the Air Force, it is of wide scope and utility and it provides a springboard for much more fundamental studies.

## Semiconductors and Related Materials

### NONLINEAR SEMICONDUCTORS AT MILLIMETER FREQUENCIES

(Order Stock No. AD-621 846 Nonlinear Semiconductors at Millimeter Frequencies, HC $4.00/MF $1.00.)

Detectors based on the thermoelectric effect of hot-carriers in bulk semiconductors can be used to detect and demodulate power over the millimeter and centimeter wavelength regions, General Telephone and Electronics Laboratories report. The

mechanism involved is such that the detection sensitivity is independent of frequency, and the input impedance is independent of input power over the normal operating range of the device. The device sensitivity is high at room temperature and is further improved by cooling. Hot-carrier microwave detectors are more burn-out resistant and less sensitive to environment factors than Schottky barrier microwave detectors of comparable sensitivities. GT and E also reports that nonlinear resistivity effects of hot-carriers in bulk semiconductors can be used to amplitude modulate cw carrier waves with high fidelity at room temperature. The researchers generated harmonic power in the millimeter-wave region by heating carriers in germanium enough to give rise to a nonlinear conductivity characteristic. They say mixers based on the thermoelectric effect of warm carriers and the nonlinear resistivity effect of hot-carriers can be used for heterodyne detection of low-level power in the millimeter wavelength range.

## Wood and Paper

GUIDE TO RANGE PLANTS

(Order Stock No. PB-168 589 Range Plant Handbook, HC $10.95/MF $3.00.)

"The Range Plant Handbook," a famous but out-of-print guide of the U. S. Forest Service, is now back in print and available from the Clearinghouse. Repeated requests from field officers of the Forest Service and others for an accurate publication in simple language, readily usable under field conditions, prompted the original publication of the work in 1937. Many requests for the work in recent years led the Clearinghouse to acquire and reissue the work in cooperation with the Forest Service. The handbook is primarily intended for busy field administrators and field workers who are not necessarily specialists in botany. Its chief purpose is twofold: (1) to evaluate for such persons, in as succinct, understandable, complete, and useful form as possible the relative importance of outstanding key plants of western ranges as regards grazing, watershed protective cover, recreation, and other uses; and (2) to enable ready field identification of these plants to insure the correlation of the proper management data with each species. Students of forestry and range management schools will also find the work helpful; it can serve as a valuable teaching aid in classroom instruction.

## Food Processing

BOTULISM SYMPOSIUM PAPERS AVAILABLE

(Order Stock No. PB-168 889 Botulism, Proceedings of a Symposium, HC $6.00/MF $1.50.)

Proceedings of a Symposium on Botulism reviews what is now known about this virulent food poisoning, how it spreads, the bacteria itself, its toxin and how to combat it, and the ability of food industries, health institutions, and Government agencies to prevent it. The meeting was prompted by the 1963 outbreaks of type "E" botulism in Tennessee, Alabama, and Michigan. Sponsored by the U. S. Public Health Service at the Robert A. Taft Sanitary Engineering Center, Cincinnati, the conference was attended by Government and industry leaders in the fields of health and food processing.

*The abundance of R&D reports available creates a problem for industry in extracting those most likely to prove of value—for technical solutions and in keeping up with new developments. These Clearinghouse tools and services are designed to narrow the search.*

REPORT

# selection aids

*Pinpointing R & D for industry*

**GOVERNMENT-WIDE INDEX**—monthly guide to Federal technical reports. Annual subscription $16, add $4 for foreign mailing, $1.75 single copy. Order from Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.

**U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS**—semimonthly journal abstracting R & D reports and listing current R & D projects. Annual subscription $15, add $3.75 for foreign mailing, single copy $1. Order from Superintendent of Documents, U. S. Government Printing Office.

**TECHNICAL TRANSLATIONS**—semimonthly foreign technical literature announcement journal listing Government and private sources. Annual subscription $12, add $4 for foreign mailing, single copy 60 cents. Order from Superintendent of Documents, U. S. Government Printing Office.

**LITERATURE SEARCHING SERVICE**—current awareness and retrospective at $11 an hour (8 hr. minimum searching time).

**FAST ANNOUNCEMENT SERVICE**—summaries of R & D reports mailed by industrial categories, free.

**BIBLIOGRAPHIES**—more than 200 are available free, send for a list. Sample:

SB–403 (Suppl. 1, Revised) Food Preservation by Irradiation
SB–413 (Suppl. 1) Beryllium
SB–419 (Suppl. 1, Revised) Desalinization of Water
SB–475 (Suppl. 1) Information and Storage
SB–488 (Suppl. 2) Masers and Lasers

**PACKAGED REVIEWS**—resumes, abstracts and bibliographies, free. Sample list:

OTR–116 Numerical Controls
OTR–117 Dielectric Films in Microelectronics
OTR–128 Plastic Coatings
OTR–129 Brazing Technology and Application
OTR–132 High Temperature Adhesives Above 500°F

*Clearinghouse for Federal Scientific and Technical Information*
*5285 Port Royal Road, Springfield, Va. 22151*

# CURRENT research & development PROJECTS

## 01. Aeronautics

PCS 49 FIELD 5A

TEMPLE UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, PENNSYLVANIA

SUPPORT OF RESEARCH ASSISTANTS - C HEMISTRY -

C. W. JEFFORD

ACS-1872-A-4
6/65- 9/65

PETROLEUM RESEARCH FUND-AMER CHEM SOC

## 02. Agriculture

GUW 96 FIELD 13G,13B, 8H

AUBURN UNIVERSITY, SCHOOL OF AGRICULTURE, AGRIC ENGINEERING, ALABAMA

CORRELATION OF SOIL SURFACE CHARACTERISTICS AND RAINFALL-RUNOFF ON SMALL AGRICULTURE WATERSHEDS ON COASTAL PLAINS SOILS

J. G. HENDRICK

INT-WR-A-005-ALA
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GYE 20133 1 FIELD 8H, 8E,12A

UNIVERSITY OF ARIZONA, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, ARIZONA

HYDRAULICS OF SURFACE IRRIGATION

C. D. BUSCH

AG-ARIZ-0585
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 40234 2 FIELD 8G, 8H, 9C, 9+

UNIV OF CAL-BERKELEY, AGRICULTURAL EXPT STA, FORESTRY, CALIFORNIA

SPECTRAL RECONNAISSANCE FOR FORESTRY

R. N. COLWELL

AG-CAL-B-MS-F-2180
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 230008 3 FIELD 13F

MISSISSIPPI STATE UNIV, AGRICULTURAL EXPT STA, AGRICULTURAL ECONOMICS, MISSISSIPPI

TRANSPORTATION OF GRAIN AND GRAIN PRODUCTS IN MISSISSIPPI

T. D. PHILLIPS

AG-MISS-0251
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

NTA 8 FIELD 7C, 7D

TEXAS A + M UNIVERSITY, SCHOOL OF ENGINEERING, TEXAS

THE DEVELOPMENT OF PILOT PLANT METHODS IN CONNECTION WITH AGRICULTURAL CHEMICAL AND OTHER RESIDUES IN COTTONSEED PRODUCTS

A. C. WAMBLE
/65- /

TEXAS A + M UNIVERSITY

YFL 356 FIELD 13B, 8H

UNIVERSITY OF FLORIDA, AGRICULTURAL EXPT STA, FLORIDA

EVALUATION OF CONSUMPTIVE WATER USE, SOIL-WATER STORAGE, AND THE WATER BUDGET FOR SMALL AGRICULTURAL WATERSHEDS IN FLORIDA

W. H. SPEIR, W. C. MILLS, E. H. STEWART
/66- /

STATE-FLORIDA

YFL 360 FIELD 8H

UNIVERSITY OF FLORIDA, AGRICULTURAL EXPT STA, FLORIDA

THE RELATION OF RAINFALL TO RUNOFF FOR AGRICULTURAL WATERSHEDS IN PENINSULAR FLORIDA

W. C. MILLS, W. H. SPEIR
/66- /

STATE-FLORIDA

YMN 23 1 FIELD 9C, 9+

UNIV OF MINNESOTA, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, MINNESOTA

STUDIES OF DESIGN CRITERIA FOR FARMSTEAD WIRING

A. M. FLIKKE
MINN-1221
/66- /

STATE-MINNESOTA

YMN 71 1 FIELD 13B, 8H

UNIV OF MINNESOTA, AGRICULTURAL EXPT STA, FORESTRY, MINNESOTA

WATERSHED VALUES AS AFFECTED BY FOREST MANAGEMENT

D. P. DUNCAN
MINN-1927
/66- /

STATE-MINNESOTA

## 04. Atmospheric Sciences

GUW 124 FIELD 8H,12A

MISSISSIPPI STATE UNIV, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, MISSISSIPPI

PRECIPITATION PROBABILITIES IN MISSISSIPPI

J. C. MCWHORTER, R. K. MATTHES

INT-WR-A-001-MISS
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 130

UNIVERSITY OF ALASKA, GRADUATE SCHOOL, GEOPHYSICAL INST, ALASKA

ATMOSPHERIC PROCESSES INVOLVED IN PRECIPITATION

T. OHTAKE, C. BENSON, G. LINDHOLM

INT-WR-A-001-ALAS
/65- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 144 FIELD 8H,12A, 8E

WEST VIRGINIA UNIV, SCHOOL OF AGRICULTURE, AGRIC ENGINEERING, WEST VIRGINIA

INFLUENCE OF TOPOGRAPHIC FEATURES ON RAINFALL IN WEST VIRGINIA

W. H. DICKERSON, J. C. BURCHINAL
R. O. WEEDFALL

INT-WR-A-006-WVA
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 194 FIELD 12A

UNIV OF CONNECTICUT, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CONNECTICUT

ANALYSIS OF QUASI-PERIODIC WEATHER DATA

C. J. POSEY

INT-WR-A-008-CONN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GYE 240113 3

UNIVERSITY OF MISSOURI, AGRICULTURAL EXPT STA, SOILS, MISSOURI

RAINFALL OVER MISSOURI

W. L. DECKER

AG-MO-0324
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 270066 3 FIELD 4B,12A

UNIVERSITY OF NEVADA, AGRICULTURAL EXPT STA, SOIL SCIENCE, NEVADA

CLIMATIC PATTERNS IN NEVADA

R. D. GIFFORD

AG-NEV-0510
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE



799-657 O - 66 B

NCA 15 FIELD 12A, 8E

UNIV OF CAL-L. A., GRADUATE SCHOOL, METEOROLOGY, CALIFORNIA

OROGRAPHIC VERTICAL MOTIONS IN CALIFORNIA RAINFALL

T. N. KRISHNAMURTI, W. BOYD, C. WOLFINDER

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NSI 10

SOUTHERN ILLINOIS UNIV, GRADUATE SCHOOL, GEOGRAPHY, ILLINOIS

COOPERATIVE CLIMATOLOGICAL RESEARCH

F. F. CUNNINGHAM
/66- /

SOUTHERN ILLINOIS UNIVERSITY

NSI 11 FIELD 13B, 8H

SOUTHERN ILLINOIS UNIV, GRADUATE SCHOOL, GEOGRAPHY, ILLINOIS

INVESTIGATION OF ENERGY BUDGETS OF MICROCLIMATES

D. B. CARTER, D. M. SHARPE
10/65- 9/66

SOUTHERN ILLINOIS UNIVERSITY

WZ 51 FIELD 12A, 8E

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, INDUSTRIAL ENGINEERING, GEORGIA

PILOT STUDY OF THE PROBABILITY OF OCCURRENCE OF CLIMATOLOGICAL PHENOMENA IN THE ATLANTA AREA

C. G. JOHNSON

/66- /

NO FORMAL SUPPORT

YCO 28 3

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

EFFECTS OF CLOUD SEEDING ON SNOWFALL

L. D. GRANT

COLO-104
/66- /

STATE-COLORADO

YCO 29 3 FIELD 4B

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

METEOROLOGICAL OBSERVATIONS

L. D. GRANT

COLO-104-A
/66- /

STATE-COLORADO

YCO 33 3 FIELD 4B

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

HAIL GENESIS AREAS

J. M. WASHICHEK

COLO.-109
/66- /

STATE-COLORADO

YCO 36 3 FIELD 8H, 4B

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

HYDROMETEOROLOGY

H. RIEHL

COLO.-113
/66- /

STATE-COLORADO

YIL 1 2

STATE, WATER SURV CHGO, ILLINOIS

URBAN INFLUENCES ON PRECIPITATION

S. A. CHANGNON

/66- /

STATE-ILLINOIS

YIL 10 2 FIELD 8H

STATE, WATER SURV CHGO, ILLINOIS

METEOROLOGY OF SEVERE RAINSTORMS

F. A. HUFF

/66- /

STATE-ILLINOIS

YIL 11 2 FIELD 8H,12A

STATE, WATER SURV CHGO, ILLINOIS

HYDROMETEOROLOGY OF SPECIFIC ILLINOIS BASINS

F. A. HUFF

/66- /

STATE-ILLINOIS

YIL 12 2 FIELD 8H

STATE, WATER SURV CHGO, ILLINOIS

HYDROMETEOROLOGICAL ANALYSIS OF SEVERE RAINSTORMS

F. A. HUFF

/66- /

STATE-ILLINOIS

YIL 22 2 FIELD 12A

STATE, WATER SURV CHGO, ILLINOIS

RADAR METEOROLOGY - RAINDROP SIZE STUDIES

E. A. MUELLER

/66- /

STATE-ILLINOIS

YIL 29 2

STATE, WATER SURV CHGO, ILLINOIS

CLIMATOLOGY OF HAIL

G. E. STOUT, S. A. CHANGNON

/66- /

STATE-ILLINOIS

YIL 30 2 FIELD 8H

STATE, WATER SURV CHGO, ILLINOIS

DENSE RAINGAGE NETWORK PROJECTS

G. E. STOUT

/66- /

STATE-ILLINOIS

YIL 202

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

TOPOGRAPHIC EFFECTS ON PRECIPITATION

S. A. CHANGNON

/66- /

STATE-ILLINOIS

YIL 204 FIELD 8D

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

RADIOACTIVITY IN RAINFALL

F. A. HUFF

/66- /

STATE-ILLINOIS

YIL 208

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

PRECIPITATION PHYSICS - WATER DROPLET COALESCENCE

R. G. SEMONIN

/66- /

STATE-ILLINOIS

## 05. Behavioral and Social Sciences

GUW 102 FIELD 13F,13B, 8H

CORNELL UNIVERSITY, SCHOOL OF IND + LB REL, IND + LABOR REL, NEW YORK

THE DEFENSE-INVOLVED COMPANYS ROLE IN THE EXPANSION OF NON-DEFENSE GOVERNMENT PROGRAMS

B. G. LALL

INT-WR-A-005-NY
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 204 FIELD 13G,13B

CORNELL UNIVERSITY, GRADUATE SCHOOL, GOVERNMENT, NEW YORK

THE POLITICS OF METROPOLITAN REGIONAL PLANNING FOR THE DEVELOPMENT OF WATER AND RELATED LAND RESOURCES.

A. ALTSHULER, C. B. COHEN, E. EPSTEIN

INT-A-010-NY
6/65- 9/65

INTERIOR-OFFICE OF WATER RESOURCES

YIL 260 1 FIELD 8D

STATE, GEOL SURV URBNA, ILLINOIS

ANNUAL SUMMARY OF PETROLEUM INDUSTRY IN ILLINOIS

L. L. WHITING, T. F. LAWRY, R. F. MAST
J. VANDENBERG
/65- /

STATE-ILLINOIS

## 06. Biological and Medical Sciences

GW 1201 2 FIELD 6B, 9+

UNIV OF CAL-L. A., SCHOOL OF ENGINEERING, ENGINEERING, CALIFORNIA

FUNDAMENTAL STUDIES OF ARM PROSTHESES SENSORY-MOTOR CONTROL

J. LYMAN, C. O. BECHTOL, M. BROOKS H. GROTH, J. +. LYMAN

RD-1201-M
9/65- 8/66

HEW-OFFICE OF VOCATIONAL REHAB

SD 260 2 FIELD 11B

TEMPLE UNIVERSITY, SCHOOL OF MEDICINE, SURGERY, PENNSYLVANIA

THE DEVELOPMENT OF ARTIFICIAL HEART VALVES

J. C. DAVILA, D. A. DELAURENTIS C. M. PHILLIPS

11/65-10/66

HARTFORD, JOHN A FOUNDATION INC

## 07. Chemistry

GUW 109 FIELD 7C, 7D, 7A, 8D

UNIV OF NORTH CAROLINA, GRADUATE SCHOOL, CHEMISTRY, NORTH CAROLINA

SOLUBILITY EQUILIBRIA INVOLVING METAL OXIDES AND CORRESPONDING AQUEOUS METAL PERCHLORATES

F. C. HENTZ

INT-WR-A-005-NC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GYE 220186 3 FIELD 7C, 7A, 7D

UNIV OF MINNESOTA, AGRICULTURAL EXPT STA, AGR. BIOCHEM. IS, MINNESOTA

STARCH FOR INDUSTRIAL USES

S. KIRKWOOD

AG-MINN-1526
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 620091 1 FIELD 7C, 7D

HEBREW UNIVERSITY IS, ISRAEL

METALATION REACTIONS FOR THE MODIFICATION OF MONO- AND DIENOIC FATTY ACIDS

E. D. BERGMANN

AGF-A10-UR-0054
12/65-11/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 810037 FIELD 7C, 7A, 7D, 7B

MINISTRY INDUSTRY-COMM, ITALY

THE EFFECT OF STEREOSPECIFIC POLYMERIZATION CATALYSTS ON FATTY ESTERS FROM SOYBEAN AND LINSEED OILS

G. JACINI

AGF-E-15-UR-046
3/65- 2/66

AGRICULTURE-DEPT OF AGRICULTURE

NCA 6 FIELD 7D,20M,20D,10B

UNIV OF CAL-BERKELEY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CALIFORNIA

SEA WATER EVAPORATION BY IMMISCIBLE LIQUID HEAT TRANSFER

S. L. GOREN, S. +. GOREN, D. HYDE L. SPIELMAN, H. VAKIL, C. R. WILKE

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 11 FIELD 11F

UNIV OF CAL-L. A., SCHOOL OF ENGINEERING, ENGINEERING, CALIFORNIA

EFFECT OF CHLORIDE IONS, OXYGEN CONTENT OF PH.

K. NOBE

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 12 FIELD 7D,20M,20D,10B

UNIV OF CAL-L. A., SCHOOL OF ENGINEERING, ENGINEERING, CALIFORNIA

FEASIBILITY STUDIES OF DISTILLATION CONCEPTS

J. W. MCCUTCHAN

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 13 FIELD 7D, 7B

UNIV OF CAL-L. A., SCHOOL OF ENGINEERING, ENGINEERING, CALIFORNIA

EVAPORATOR SCALE CONTROL STUDIES

J. W. MCCUTCHAN

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 14 FIELD 7D,20M,20D,10B

UNIV OF CAL-L. A., SCHOOL OF ENGINEERING, ENGINEERING, CALIFORNIA

HEAT AND MASS TRANSFER STUDIES APPLIED TO WATER DESALINATION

M. C. JONES, J. L. DYER, R. L. PERRINE

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 16 FIELD 7D,11F

UNIV OF CAL-L. A., SCHOOL OF ENGINEERING, ENGINEERING, CALIFORNIA

SALINE WATER DEMINERALIZATION BY REVERSE OSMOSIS

S. LOEB

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 18 FIELD 7D,11G,10B, 7B

UNIV OF CAL-BERKELEY, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, CALIFORNIA

DISTILLATION

E. D. HOWE, E. I. EWOLDSEN D. E. SKERRITT, B. W. TLEIMAT

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 19 FIELD 7C, 7A, 7D

UNIV OF CAL-BERKELEY, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, CALIFORNIA

ELECTRODIALYSIS

E. D. HOWE, K. S. SPIEGLER, Z. URBAN R. A. WALLACE, S. A. WEINER

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 24 FIELD 7D

UNIV OF CAL-L. A., SCHOOL OF ENGINEERING, ENGINEERING, CALIFORNIA

MASS TRANSFER OF CONCENTRATED ELECTROLYTES

D. N. BENNION

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NF 6 FIELD 7D, 7A, 9+, 9A

NORTHWESTERN UNIV, GRADUATE SCHOOL, CHEMISTRY, ILLINOIS

A MULTIPURPOSE INSTRUMENT FOR QUANTITATIVE CHEMICAL MEASUREMENTS

D. D. DEFORD, E. H. NAGEL

1/64-12/64

NORTHWESTERN UNIVERSITY

NGI 21 FIELD 13B, 7D, 7B

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, TEXTILES, GEORGIA

THE RECOVERY AND RE-USE OF CAUSTIC SODA FROM THE MERCERIZING PROCESS

L. D. JONES, W. L. HYDEN, R. INGOLS

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 22 FIELD 7D,20D,10B, 7B

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, GEORGIA

EVAPORATION OF LIQUID IN A HYDRO-CYCLONE

T. W. JACKSON, J. W. HODGSON

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 23 FIELD 7D,20M, 8M,20D

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, GEORGIA

BEHAVIOR OF LIQUID-AIR INTERFACE IN A KUNDTS TUBE

T. W. JACKSON, B. F. BARFIELD

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NJH 1 FIELD 7C, 7A, 7D, 7B

JOHNS HOPKINS UNIV, SCHOOL OF ENGINEERING, SANITARY ENGINEERING, MARYLAND

THE OXIDATION OF COAL MINE PYRITE

C. E. RENN, C. S. CLARK

/66- /

JOHNS HOPKINS UNIVERSITY

NSI 5 FIELD 7C, 7A, 7D,20M

SOUTHERN ILLINOIS UNIV, GRADUATE SCHOOL, CHEMISTRY, ILLINOIS

REACTIONS AT THE SOLUTION-AIR INTERFACE

R. J. RUCH

9/64- 8/65

SOUTHERN ILLINOIS UNIVERSITY

NWA 18 FIELD 7D

WASHINGTON STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, WASHINGTON

SQUARE-WAVE PULAROGRAPHY

R. E. HAMM, E. L. JOHNSON

3/65- 2/66

WASHINGTON STATE UNIVERSITY

PCS 9 FIELD 7C, 7D

UNIVERSITY OF SO FLA, UNDERGRADUATE SCHOOL, CHEMISTRY, FLORIDA

HETEROAROMATIC COMPOUNDS

T. W. SOLOMONS

ACS-1605-B
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 10 FIELD 7D,20J

FRESNO STATE COLLEGE, GRADUATE SCHOOL, CHEMISTRY, CALIFORNIA

STEREOCHEMICAL ISOMER STUDIES

G. B. KAUFFMAN

ACS-1152-B
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 11 FIELD 7D,20J, 7B

ILLINOIS INST OF TECH, GRADUATE SCHOOL, CHEMISTRY, ILLINOIS

ELECTRONIC STRUCTURE OF TRANSITION METAL ZEOLITES

J. P. THOMAS

ACS-2460-A-3-5
6/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 12 FIELD 7D, 7C, 7B

KANSAS ST UNIV AGR SCI, GRADUATE SCHOOL, CHEMISTRY, KANSAS

CHEMISORBED SPECIES

R. M. HAMMAKER

ACS-2382-A-3
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 13 FIELD 7D,20J,20D,20L

KANSAS ST UNIV AGR SCI, GRADUATE SCHOOL, CHEMISTRY, KANSAS

INFRARED STUDIES OF CHEMISORBED MOLECULES ON CHARGED SURFACES

C. E. MELOAN

ACS-2369-A-3
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 14 FIELD 7D,11C,11F, 7B

LAKE FOREST COLLEGE, UNDERGRADUATE SCHOOL, CHEMISTRY, ILLINOIS

STRIPPING ANALYSIS STUDIES

J. W. BIXLER

ACS-2407-B
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 15 FIELD 7D, 7A,20J, 7B

UNIV OF MASSACHUSETTS, GRADUATE SCHOOL, CHEMISTRY, MASSACHUSETTS

DEUTERON QUADRUPOLE COUPLING

J. L. RAGLE

ACS-2371-A-5
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 16 FIELD 7C, 7D,20J

UNIV OF MINNESOTA, GRADUATE SCHOOL, CHEMISTRY, MINNESOTA

ORGANOMETALLIC REARRANGEMENTS AND STRUCTURE

E. A. HILL
ACS-1383-A-4
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 17 FIELD 7C, 7A, 7D

NORTHWESTERN UNIV, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, ILLINOIS

DEPOLYMERIZATION OF POLYACETALDEHYDE

W. W. GRAESSLEY

ACS-2405-A-2-4
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 18 FIELD 7C, 7A, 7D, 7B

UNIV OF NOTRE DAME, GRADUATE SCHOOL, CHEMISTRY, INDIANA

REACTIONS OF HETEROSUBSTITUTED ORGANOBORANES

D. J. PASTO
ACS-1225-A-1-3
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 21 FIELD 7C, 7A, 7D, 7B

UNIVERSITY OF OKLAHOMA, SCHOOL OF ENGINEERING, PETROLEUM ENGINEERING, OKLAHOMA

HYDROCARBON CLATHRATE SOLUTIONS

J. M. CAMPBELL

ACS-1548-A-2-5
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 35 FIELD 7C,20J, 7B

AMHERST COLLEGE, UNDERGRADUATE SCHOOL, CHEMISTRY, MASSACHUSETTS

EPITHERMAL CHEMICAL REACTIONS

R. D. FINK
ACS-2452-B
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 36 FIELD 7C

COLUMBIA UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, NEW YORK

RESEARCH IN THE AREA OF THEORETICAL CHEMISTRY

M. KARPLUS

ACS-2483-C
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 42 FIELD 7C, 7D, 7A, 7B

RUTGERS THE STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, NEW JERSEY

STUDY OF THE KINETICS AND MECHANISM OF OLEFIN PT - II - COMPLEXES

S. I. SHUPACK

ACS-2446-A-3
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 43 FIELD 20J

OBERLIN COLLEGE, GRADUATE SCHOOL, CHEMISTRY, OHIO

NON-BONDED FORCES IN CIS-TRANS ISOMERS

N. C. CRAIG
ACS-2422-B
6/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 46 FIELD 7C

OHIO STATE UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, OHIO

HEXAHELICENE CHEMISTRY

M. S. NEWMAN

ACS-2471-X
7/65- 6/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 47 FIELD 7D, 5A

GEORGETOWN UNIVERSITY, GRADUATE SCHOOL, DIST OF COLUMBIA

TOKYO CONFERENCE ON PHOTOCHEMISTRY, AUGUST 25-28 1965

C. L. CURRIE

ACS-1601-E
7/65-12/65

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 48 FIELD 7C

UNIV OF VT + ST AGRIC, GRADUATE SCHOOL, CHEMISTRY, VERMONT

REACTIVE INTERMEDIATES IN ORGANIC CHEMISTRY

W. N. WHITE

ACS-2090-X
4/65- 3/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

UP 2278 FIELD 7D, 7A

UNIV OF MANITOBA, SCHOOL OF DENTISTRY, BIOLOGY, CANADA

LIQUID CHROMATOGRAPHY ANALYTICAL SYSTEM

E. T. PRITCHARD

DE-14
7/63- 6/64

MEDICAL RESEARCH COUNCIL OF CANADA

UT 460 FIELD 7C,20J

UNIVERSITY OF UTAH, UTAH

SOLVENT EFFECTS ON BOND HOMOLYSIS

W. G. BENTRUDE

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 462 FIELD 7D, 7A, 7B

UNIVERSITY OF IDAHO, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, IDAHO

EFFECT OF OXIDE FORMATION ON THE CATALYTIC BEHAVIOR OF BRIGHT PLATINUM ANODES

G. R. BOPP, J. O. HOUSEWEART

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 463 FIELD 7C, 7D

CAL INST OF TECHNOLOGY, GRADUATE SCHOOL, CHEMISTRY + CHEM ENGIN, CALIFORNIA

SYNTHETIC STUDIES IN STRAIN FREE POLYCYCLIC SYSTEMS

M. BROWN
1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 464 FIELD 7C, 7D, 7B

LOYOLA UNIVERSITY, GRADUATE SCHOOL, ILLINOIS

FLASH PHOTOLYTIC STUDY OF THE REACTIONS OF NITRIC OXIDE WITH FREE RADICALS

E. J. BURRELL

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 466 FIELD 7D, 7B

FLORIDA STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, FLORIDA

COORDINATION CHEMISTRY OF PHOSPHORUS TRIFLUORIDE

R. J. CLARK

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 467 FIELD 7C, 7D, 7B

MARIETTA COLLEGE, UNDERGRADUATE SCHOOL, OHIO

THE WURTZ REACTION IN ORGANOSILICON CHEMISTRY

J. W. CONNOLLY

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 472 FIELD 7C

MALONE COLLEGE, OHIO

THE SULFOXIDE PYRAMID IN HIGHLY STRAINED SYSTEMS

K. R. FOUNTAIN
1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 476 FIELD 7C, 7D

PASADENA COLLEGE, CALIFORNIA

A STUDY OF THE EFFECT OF NEIGHBORING GROUPS ON THE REACTION OF SUBSTITUTED BUTENE TOSYLATES

V. L. HEASLEY

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 478 FIELD 7D

DENISON UNIVERSITY, UNDERGRADUATE SCHOOL, , OHIO

GAS CHROMATOGRAPHIC IDENTIFICATION OF ART MEDIA

W. A. HOFFMAN
1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 479 FIELD 7D, 7A

ST. LOUIS UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, MISSOURI

DETERMINATION OF ORGANIC ELECTRODE MECHANISMS VIA CONTROLLED POTENTIAL COULOMETRY AND CYCLIC VOLTAMMETRY

T. LAYLOFF

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 480 FIELD 7C, 7D,20J

SMITH COLLEGE, GRADUATE SCHOOL, CHEMISTRY, MASSACHUSETTS

A SYSTEMATIC STUDY OF THE RELATION BETWEEN ELECTRON DENSITY AND THE ULTRAVIOLET SPECTRUM ON NONCONJUGATED CHROMOPHORE

J. N. LOWE
1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 481 FIELD 7B

MILLS COLLEGE, CALIFORNIA

THE CHEMISTRY OF SOME NITROGEN OXYACIDS AND THEIR SALTS

C. LUTZ

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 482 FIELD 7D, 7A, 7B

MCMURRY COLLEGE, TEXAS

INVESTIGATION OF TRANSITION METAL COMPLEXES IN MOLTEN POTASSIUM THIOCYANATE

W. L. MAGNUSON

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 485 FIELD 7C, 7D,14E,20J

WESLEYAN UNIVERSITY, GRADUATE SCHOOL, PHYSICS, CONNECTICUT

PHOTOELECTRIC INVESTIGATION OF SILVER HALIDE BAND STRUCTURE AND ENERGY TRANSFER MECHANISMS IN DYED SAMPLES

C. W. PETERSON

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 489 FIELD 7C,20J

CHICO STATE COLLEGE, CALIFORNIA

EFFECTS OF PARALLEL AND PERPENDICULAR PI-ELECTRON SYSTEMS

L. A. SMITH
1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 490 FIELD 7C

UNIV OF MISSISSIPPI, GRADUATE SCHOOL, CHEMISTRY, MISSISSIPPI

DIALKOXY CARBENES

A. P. STEFANI

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 491 FIELD 7D,20J

WESTERN RESERVE UNIV, GRADUATE SCHOOL, CHEMISTRY, OHIO

HETEROGENEOUS CATALYSTS AND CONFIGURATIONAL STABILITY

A. L. TERNAY

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 494 FIELD 7C, 7D

CITY UNIV N Y NEW YORK, GRADUATE SCHOOL, NEW YORK

THE SYNTHESIS AND ELECTRONIC SPECTRA OF SOME NOVEL ORGANOPHOSPHORUS AND ORGANOARSENIC COMPOUNDS

M. A. WEINER
1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 496 FIELD 7C, 7D, 7A,20M

RENSSELAER POLYTC INST, GRADUATE SCHOOL, CHEMISTRY, NEW YORK

KINETIC STUDIES BY HIGH TEMPERATURE MICROSCOPY ON SINGLE CRYSTALS OF TRANSITION METAL COMPOUNDS

H. WIEDEMEIER

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 497 FIELD 7C

MARYVILLE COLLEGE, TENNESSEE

CHEMISTRY

D. P. YOUNG

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

YCA 206 3 FIELD 7C, 7A, 7D

UNIV OF CAL-DAVIS, AGRICULTURAL EXPT STA, AGR. CHEMISTRY, CALIFORNIA

HALOGEN COMPLEXES OF ORGANIC SUBSTANCES AND THE MECHANISM OF AROMATIC HALOGENSTION

R. M. KEEFER

CAL-D-1218
/66- /

STATE-CALIFORNIA

YCA 222 3 FIELD 7C, 7A, 7D,20J

UNIV OF CAL-DAVIS, AGRICULTURAL EXPT STA, AGR. CHEMISTRY, CALIFORNIA

PHOTOCHEMICAL AND FREE RADICAL REACTIONS

D. H. VOLMAN

CAL-D-1392
/66- /

STATE-CALIFORNIA

YCA 255 3 FIELD 7C, 7A, 7D

UNIV OF CAL-DAVIS, AGRICULTURAL EXPT STA, AGR. CHEMISTRY, CALIFORNIA

SUBSTITUTIONS AT THE ANOMERIC CARBON

O. S. SCHALM, R. C. LABEN

CAL-D-1598
/66- /

STATE-CALIFORNIA

YCA 260 3 FIELD 7C, 7A, 7D

UNIV OF CAL-DAVIS, AGRICULTURAL EXPT STA, AGR. CHEMISTRY, CALIFORNIA

ADSORPTION OF GASES ON SOLIDS

D. H. VOLMAN

CAL-D-1616
/66- /

STATE-CALIFORNIA

YIL 206 FIELD 7C, 7D, 8D, 8H

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

CHROMATOGRAPHIC ANALYSIS FOR ORGANIC ACIDS IN WATER

T. E. LARSON, H. F. MUELLER, F. W. SOLLO
/66- /

STATE-ILLINOIS

YIL 207 FIELD 7C, 7D, 8H, 7B

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

DETERMINATION OF FREE CHLORINE RESIDUALS IN WATER

T. E. LARSON, F. W. SOLLO

/66- /

STATE-ILLINOIS

YIL 277 1 FIELD 7C, 7D, 7B

STATE, GEOL SURV URBNA, ILLINOIS

DEVELOPMENT OF NEW FLUORINE COMPOUNDS

G. C. FINGER, D. R. DICKERSON

/65- /

STATE-ILLINOIS

YIN 38 3 FIELD 7C

PURDUE UNIVERSITY, AGRICULTURAL EXPT STA, BIOCHEMISTRY, INDIANA

PRODUCTION OF NEW TYPES OFHYDROPHYLIC POLYMERS WITH CARBOHYDRATES

R. L. WHISTLER

IND-1029
/66- /

STATE-INDIANA

YKA 73 3 FIELD 7C, 7D,21D,20J

KANSAS ST UNIV AGR SCI, AGRICULTURAL EXPT STA, CHEMISTRY, KANSAS

FACTORS INVOLVED IN FLAME PHOTOMETRY

W. G. SCHRENK

KAN-533
/66- /

STATE-KANSAS

YKA 97 3 FIELD 7C, 7D, 7B

KANSAS ST UNIV AGR SCI, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, KANSAS

PURIFICATION OF LACTIC ACID BY SEPARATION FROM THE IMPURITIES PRESENT IN THE FERMENTATION LIQUOR

H. T. BATES

KAN-602
/66- /

STATE-KANSAS

## 08. Earth Sciences and Oceanography

GUW 104 FIELD 8D, 8F, 8H, 8G

UNIVERSITY OF FLORIDA, SCHOOL OF ENGINEERING, WATER RESOURCES, FLORIDA

RATE OF SOLUTION OF LIMESTONE IN THE KARST TERRANE OF FLORIDA

H. K. BROOKS, H. *. BROOKS

INT-WR-A-004-FLA
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 105 FIELD 13G, 8H,12A, 5C

UNIV OF NORTH CAROLINA, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, NORTH CAROLINA

RUNOFF FROM RAINFALL AND TOPOGRAPHICAL DATA AND THE ROUTING OF FLOW IN STREAMS

M. AMEIN

INT-WR-A-001-NC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 111 FIELD 13B, 8H

UNIV OF NORTH CAROLINA, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, NORTH CAROLINA

DIFFUSION AND DISPERSION IN POROUS MEDIA

A. I. KASHEF

INT-WR-A-007-NC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 113 FIELD 8H, 8G

UNIV OF NORTH CAROLINA, SCHOOL OF ENGINEERING, GEOLOGICAL ENGINEERING, NORTH CAROLINA

GROUND WATER YIELDS IN RALEIGH QUADRANGLE, NORTH CAROLINA

J. M. PARKER

INT-WR-A-009-NC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 114 FIELD 8H,12A, 5C, 8E

UNIV OF NORTH CAROLINA, SCHOOL OF PUBLIC HLTH, ENVIRON SCI + ENGIN, NORTH CAROLINA

THE EFFECT OF DIFFERENT LOW-FLOW HYDROLOGIC REGIMES ON WATER QUALITY MANAGEMENT

J. K. SHERWANI
INT-WR-A-010-NC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 116 FIELD 13B, 8H,12A

UNIV OF NORTH CAROLINA, SCHOOL OF AGRICULTURE, AGRIC ENGINEERING, NORTH CAROLINA

RAINFALL DISPOSITION OVER A SLOPING LAND MASS

E. H. WISER
INT-WR-A-012-NC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 117 FIELD 13B, 8H

NEW MEX STATE UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, NEW MEXICO

SYNTHETIC HYDROLOGY

W. VIESSMAN
INT-WR-A-001-NMEX
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 120 FIELD 13B, 8D, 8H

NEW MEX STATE UNIV, SCHOOL OF AGRICULTURE, AGRONOMY, NEW MEXICO

THE EFFECTS OF SOIL PROPERTIES ON THE RETENTION, PERCOLATION, AND RUN-OFF OF PRECIPITATION

J. U. ANDERSON, M. D. COOK, A. E. STEWART
INT-WR-A-004-NMEX
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 126 FIELD 8D, 8F, 8H, 8G

UNIV OF KENTUCKY, GRADUATE SCHOOL, WATER RESOURCES, KENTUCKY

A FIELD AND LABORATORY STUDY OF FACTORS CONTROLLING POROSITY AND PERMEABILITY IN THE CURDSVILLE MEMBER OF THE LEXINGTON LIMESTONE

W. C. MACQUOWN, W. *. MACQUOWN
J. THRAILKILL
INT-WR-A-003-KY
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 136 FIELD 8F, 8H, 8G

CLEMSON UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY + GEOLOGY, SOUTH CAROLINA

BEDROCK INFLUENCE ON SEDIMENT LOAD OF SELECTED HARTWELL RESERVOIR TRIBUTARIES
C. Q. BROWN, P. K. BIRKHEAD
V. S. GRIFFIN
INT-WR-A-004-SC
/66- /
INTERIOR-OFFICE OF WATER RESOURCES

GUW 138 FIELD 8H

WEST VIRGINIA UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WEST VIRGINIA

RUNOFF STUDIES ON SMALL WATERSHEDS

J. C. BURCHINAL, W. H. DICKERSON

INT-WR-A-003-WVA
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 143 FIELD 8H

PRINCETON UNIVERSITY, SCHOOL OF ENGINEERING, GEOLOGICAL ENGINEERING, NEW JERSEY

HYDROLOGIC ANALYSIS OF THE MILLSTONE RIVER BASIN, NEW JERSEY

L. M. BRUSH, R. J. DEWIEST

INT-WR-A-011-NJ
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 151 FIELD 13G,13B, 8H

CLEMSON UNIVERSITY, SCHOOL OF ENGINEERING, ENGINEERING MECHANICS, SOUTH CAROLINA

TEMPERATURE STUDY OF GROUND WATER - S URFACE WATER RELATIONSHIP

A. G. LAW

INT-WR-A-005-SC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 152 FIELD 8D, 8H, 8G

RUTGERS THE STATE UNIV, GRADUATE SCHOOL, GEOLOGY, NEW JERSEY

PETROLOGY OF AQUIFERS OF NEW JERSEY COASTAL PLAIN

J. H. MARTENS, J. F. BOWMAN, D. A. HAMLEN W. C. ISPHORDING

INT-WR-A-006-NJ
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 159 FIELD 13G, 8F, 8H, 8G

UNIVERSITY OF IOWA, GRADUATE SCHOOL, GEOGRAPHY, IOWA

DISCHARGE - VALLEY FORM RELATIONSHIPS OF SELECTED IOWA STREAMS

N. E. SALISBURY

INT-WR-A-006-IA
7/65- 6/66

INTERIOR-OFFICE OF WATER RESOURCES

GUW 162 FIELD 8H, 8G

RUTGERS THE STATE UNIV, GRADUATE SCHOOL, GEOLOGY, NEW JERSEY

WATER WELL YIELDS IN THE NEW JERSEY HIGHLANDS IN RELATION TO GEOLOGIC ENVIRONMENT

B. L. SMITH

INT-WR-A-007-NJ
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 168 FIELD 8F, 8H

RUTGERS THE STATE UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, NEW JERSEY

DROUGHT FREQUENCY, INTENSITY AND DURATION - ITS CORRELATION TO STREAMFLOW AND ITS IMPACT UPON SYNTHETIC HYDROLOGY

W. B. SNOW, A. V. HAVENS, J. HOROWITZ C. LIU, M. D. SHULMAN

INT-WR-A-002-NJ
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 170 FIELD 8H, 8G

UNIV OF CONNECTICUT, GRADUATE SCHOOL, GEOLOGY + GEOGRAPHY, CONNECTICUT

RELATION OF BEDROCK FEACTURE SYSTEMS TO UNDERGROUND SUPPLIES

J. M. AITKEN
INT-WR-A-004-CONN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 178 FIELD 8F, 8N, 8H, 8G

UNIV OF RHODE ISLAND, GRADUATE SCHOOL, GEOLOGY, RHODE ISLAND

POTENTIAL GROUND-WATER HYDRALOGIC CHARACTERISTICS OF GLACIAL DEPOSITS AS DETERMINED BY ELECTRIC RESISTIVITY CRITERIA

J. J. FISHER, E. J. TYNAN
INT-WR-A-008-RI
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 183 FIELD 8H, 8G

NEW MEX STATE UNIV, GRADUATE SCHOOL, EARTH SCIENCES, NEW MEXICO

GEOHYDROLOGY OF THE LOWER RIO GRANDE VALLEY AND ADJACENT INTERMONTANE AREAS OF NEW MEXICO

W. E. KING
INT-WR-A-008-NMEX
7/65- 6/66

INTERIOR-OFFICE OF WATER RESOURCES

GUW 184 FIELD 13B,12A, 8E

IOWA ST UNIV SCI TECH, SCHOOL OF AGRICULTURE, AGRONOMY, IOWA

MOISTURE MOVEMENT TO VERTICAL SINKS IN WATER-UNSATURATED SOIL

D. KIRKHAM
INT-WR-A-003-IA
7/65- 6/66

INTERIOR-OFFICE OF WATER RESOURCES

GUW 185 FIELD 7D, 8D, 8H, 8G

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

USE OF LAKE SEDIMENT CORES TO ESTIMATE RATE OF EUTROPHICATION OF LAKES

G. F. LEE, D. A. WENTZ

INT-WR-A-001-WIS
7/65- 6/66

INTERIOR-OFFICE OF WATER RESOURCES

GUW 190 FIELD 8H, 7B

UNIVERSITY OF NEVADA, GRADUATE SCHOOL, DESERT RESEARCH INST, NEVADA

CHEMICAL AND PHYSICAL ASPECTS OF MOUNTAIN AND MINING HYDROLOGY

M. D. MIFFLIN

INT-WR-A-001-NEV
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 192 FIELD 13G,13B, 8H

UNIV OF RHODE ISLAND, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, RHODE ISLAND

STATIC AND DYNAMIC BEHAVIOR OF SOILS
V. A. NACCI

INT-WR-A-006-RI
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 221 FIELD 8H

STATE, BUR MINES-GEOL, MONTANA

HYDROGEOLOGY OF THE GREAT FALLS AREA, MONTANA

S. L. GROFF, J. W. GOERS, A. J. SILVERMAN

INT-A-006-MONT
7/65- 6/66

INTERIOR-OFFICE OF WATER RESOURCES

GYE 40158 3 FIELD 13B

UNIV OF CAL-BERKELEY, AGRICULTURAL EXPT STA, SOILS + PLANT NUTR, CALIFORNIA

PROPERTIES OF SOILS RELATED TO APPLIED STRESSES

G. B. BODMAN
AG-CAL-1898
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 40268 FIELD 13B, 8D, 8G

UNIV OF CAL-BERKELEY, AGRICULTURAL EXPT STA, SOILS + PLANT NUTR, CALIFORNIA

PEDOLOGIC STUDY OF SOILS FORMED ON PLEISTOCENE DEPOSITS IN CALIFORNIA

P. W. BIRKELAND

AG-CAL-B-2295
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 110095 3 FIELD 13B, 8G

UNIVERSITY OF IDAHO, AGRICULTURAL EXPT STA, AGR. CHEM. RY, IDAHO

CLAY STUDIES ON SELECTED SOILS AND PARENT MATERIALS OF IDAHO

G. C. LEWIS

AG-IDA-0449
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 120065 3 FIELD 13B

UNIVERSITY OF ILLINOIS, AGRICULTURAL EXPT STA, AGRONOMY, ILLINOIS

MOISTURE CONDITIONS + WATER TRANSPORT IN SOILS

A. KLUTE

AG-ILL-15-381
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 130171 3 FIELD 13B, 8H,20D

PURDUE UNIVERSITY, AGRICULTURAL EXPT STA, AGRONOMY, INDIANA

FLOW LAWS FOR THE MOVEMENT OF WATER IN SOILS

D. SWARTZENDRUBER
AG-IND-1270
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 170117 3 FIELD 13B, 8F, 8H

LOUISIANA ST UNIV A+M, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, LOUISIANA

RUNOFF OF SMALL WATERSHEDS

J. E. WIMBERLY

AG-LA-1104
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 310167 3 FIELD 13B

CORNELL UNIVERSITY, AGRICULTURAL EXPT STA, AGRONOMY, NEW YORK

THE MECHANISM OF FROST HEAVING IN SOIL

R. L. CHAHAL

AG-NYC-0333
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 320221 2 FIELD 8D, 8H, 8G

UNIV OF NORTH CAROLINA, AGRICULTURAL EXPT STA, SOILS, NORTH CAROLINA

INTERACTIONS IN CLAY-WATER SYSTEMS

R. J. MILLER

AG-NC-H-0269
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 430022 3 FIELD 13B, 8H

UTAH ST UNIV OF AGRIC, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, UTAH

DEVELOPMENT OF IMPROVED SNOW SURVEYING AND STREAM-FLOW FORECASTING TECHNIQUES

C. H. MILLIGAN

AG-UTAH-0459
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

NCA 21 FIELD 7D,20M, 8D, 8G

UNIV OF CAL-DAVIS, SCHOOL OF AGRICULTURE, SOILS + PLANT NUTR, CALIFORNIA

THE THERMODYNAMICS OF WATER ADSORPTION BY HOMOIONIC KAOLINITE AND IRON OXIDE FROM HEATS OF IMMERSION AND ADSORPTION DATA

R. G. BURAU, J. W. BIGGAR, J. W. CARY
J. J. JURINAK, C. P. NASH, D. H. VOLMAN

/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 22 FIELD 7D, 8D, 8H, 8G

UNIV OF CAL-LA JOLLA, GRADUATE SCHOOL, EARTH SCIENCES, CALIFORNIA

ISOTOPIC VARIATIONS IN NATURAL WATERS

H. CRAIG, L. I. GORDON
/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 23 FIELD 13G

UNIV OF CAL-BERKELEY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CALIFORNIA

SEDIMENT TRANSPORT IN DEGRADING RIVERS

H. A. EINSTEIN
/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NCA 25 FIELD 13B,20D

UNIV OF CAL-DAVIS, SCHOOL OF AGRICULTURE, WATER SCIENCE + ENGIN, CALIFORNIA

THE PHYSICAL AND CHEMICAL FACTORS RESPONSIBLE FOR THE TRANSMISSION CHARACTERISTICS OF SATURATED AND UNSATURATED SOIL

J. W. BIGGAR, D. R. NIELSEN
/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NDE 2 1 FIELD 13G,13B, 8H

UNIVERSITY OF DELAWARE, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, DELAWARE

URBAN HYDROLOGIC STUDY

I. ZANDI, R. RAZAGHY

/66- /

DELAWARE, UNIVERSITY OF

NGI 2 FIELD 8F, 8H,12A, 8E

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

MINIMUM FLOW PREDICTION AND REGIONAL CHARACTERIZATION

W. M. SNYDER
/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 3 FIELD 13G,13B, 8H

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

AN URBAN HYDROLOGY STUDY IN EAST POINT, GEORGIA

W. M. SNYDER, C. C. JONES
/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 4 FIELD 8H,12A, 8E

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

ERROR ANALYSIS OF LINEAR SEGMENTED HYDROLOGIC FUNCTIONS

W. M. SNYDER

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 5 FIELD 13G, 8H

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

LABORATORY WATERSHED MODELS

W. M. SNYDER, G. M. SLAUGHTER

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 7 FIELD 13G, 8H,12A, 8E

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

STATISTICAL ANALYSIS OF FLOOD PEAKS OF GEORGIA RIVERS

G. M. SLAUGHTER

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 17 FIELD 13G

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

SEDIMENT TRANSPORT FUNCTIONS WITH PARTICULAR EMPHASIS ON LOCALIZED SCOUR

M. R. CARSTENS, A. R. LEFEUVRE
/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NIN 2 FIELD 8D, 8F, 8H, 8G

INDIANA UNIVERSITY, GRADUATE SCHOOL, GEOLOGY, INDIANA

HYDROGEOLOGY OF PART OF THE JEFFERSON VALLEY-AN INTERMONTANE BASIN IN SOUTHWESTERN MONTANA

M. R. MILLER, A. F. AGNEW
/66- /

INDIANA UNIVERSITY

NIN 3 FIELD 8D, 8F, 8H, 8G

INDIANA UNIVERSITY, GRADUATE SCHOOL, GEOLOGY, INDIANA

HYDROGEOLOGY OF MITCHELL PLAIN AND CRAWFORD UPLAND IN NORTHWESTERN LAWRENCE COUNTY, INDIANA

A. N. PALMER, A. F. AGNEW
/66- /

INDIANA UNIVERSITY

NIN 9 FIELD 8F, 8H

INDIANA UNIVERSITY, GRADUATE SCHOOL, GEOLOGY, INDIANA

CONTRIBUTIONS TO RUNOFF FROM SPOIL BANKS OF COAL STRIP-MINING ACTIVITY IN PIKE COUNTY, INDIANA

A. F. AGNEW, D. M. CORBETT

/66- /

INDIANA UNIVERSITY

NKS 1 FIELD 8H

KANSAS ST UNIV AGR SCI, GRADUATE SCHOOL, ZOOLOGY, KANSAS

CHEMICAL NATURE OF KANSAS SURFACE WATERS

G. R. MARZOLF
/66- /

KANSAS STATE UNIVERSITY

NMF 1 FIELD 13J, 8C,11F,11G

UNIVERSITY OF MIAMI, SCHOOL OF ENGINEERING, ELECTRICAL ENGINEERING, FLORIDA

EXPLORATORY RESEARCH RELATED TO NETTING AND DREDGING PROBLEMS

W. C. KNOPF, L. J. GREENFIELD
R. A. WAGSTAFF

/65- /

MIAMI, UNIVERSITY OF

NMT 6 FIELD 13G,20D

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MASSACHUSETTS

MECHANICS OF SEDIMENT RIPPLES AND DUNES

J. F. KENNEDY
/66- /

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NSI 13 FIELD 8D

SOUTHERN ILLINOIS UNIV, GRADUATE SCHOOL, GEOLOGY, ILLINOIS

A RESTUDY AND REVISION OF PALEOZOIC BRYOZOAN GENERA OF THE SUBORDERS CERAMOPOROIDEA AND FISTULIPOROIDEA

J. UTGAARD, R. S. BOARDMAN
/66- /

SOUTHERN ILLINOIS UNIVERSITY

NSI 14 FIELD 8F, 8H, 8G

SOUTHERN ILLINOIS UNIV, GRADUATE SCHOOL, GEOGRAPHY, ILLINOIS

THE INFLUENCE OF LITHOLOGY IN DETERMINING MORPHOMETRIC FORM IN A FLUVIALLY DISSECTED AREA

P. L. HOSKING

/66- /

SOUTHERN ILLINOIS UNIVERSITY

NTT 1 FIELD 8H,20D

TEXAS TECHNOL COLLEGE, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, TEXAS

MOVEMENT OF SALT WATER IN FRESH WATER AQUIFERS

K. R. MARMION

9/64- 8/65

TEXAS TECHNOLOGICAL COLLEGE

NUS 15 FIELD 13G

UTAH ST UNIV OF AGRIC, SCHOOL OF ENGINEERING, CIVIL + IRRIG ENGIN, UTAH

THE EFFECT OF SEEPAGE FLOW ON THE HYDRODYNAMIC FORCES ACTING ON BED PARTICLES IN A FLOWING STREAM

G. Z. WATTERS, O. CLARK

/66- /

UTAH STATE UNIVERSITY

NUS 16 FIELD 8G, 8H

UTAH ST UNIV OF AGRIC, GRADUATE SCHOOL, WATER RESOURCES, UTAH

INSTRUMENTATION AND DEVELOPMENT OF TECHNIQUES TO MEASURE AND EVALUATE METEOROLOGICAL PROBLEMS IMPORTANT TO HYDROLOGY

D. G. CHADWICK, G. L. ASHCROFT
P. E. BULLER, D. +. CHADWICK
J. E. FLETCHER, D. L. GRIFFIN

/66- /

UTAH STATE UNIVERSITY

NWS 9 FIELD 8H, 8E,12A

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

THE RELATIONSHIPS OF WATERSHED CHARACTERISTICS AND THEIR EFFECT ON HYDROLOGIC PARAMETERS

L. R. MASSIE, A. T. LENZ

/66- /

WISCONSIN, UNIVERSITY OF

NWS 10 FIELD 13G, 8H,20D

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

LANGMUIR CIRCULATION IN LAKES

P. L. MONKMEYER, G. R. LEE, P. UTTORMARK

/66- /

WISCONSIN, UNIVERSITY OF

NWS 11 FIELD 13G,13B, 8H

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

THE EFFECT OF STREAMBANK CLOGGING ON UNSTEADY GROUNDWATER FLOW

P. L. MONKMEYER, A. G. LAW

/66- /

WISCONSIN, UNIVERSITY OF

NWS 12 FIELD 13G,13B

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

CHARACTERISTICS OF UNSTEADY, UNCONFINED FLOW OF GROUNDWATER

P. L. MONKMEYER, D. T. HIGGINS

/66- /

WISCONSIN, UNIVERSITY OF

NWS 13 FIELD 12A, 8E

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

PREDICTING STREAMFLOW BY THE STUDY OF GROUNDWATER RECESSION CURVES

A. T. LENZ, D. D. SECHER

/66- /

WISCONSIN, UNIVERSITY OF

PCS 22 FIELD 8D, 8G

RENSSELAER POLYTC INST, GRADUATE SCHOOL, GEOLOGY, NEW YORK

DIAGENESIS OF CARBONATE SEDIMENTS

G. M. FRIEDMAN

ACS-2393-A-2
9/65- 8/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PCS 27 FIELD 8D, 8G, 7B

WASHINGTON UNIVERSITY, GRADUATE SCHOOL, EARTH SCIENCES, MISSOURI

GEOCHEMISTRY OF CHLORINE IN ARGILLACEOUS SEDIMENTS

W. D. JOHNS

ACS-2406-A-2
7/65- 6/66

PETROLEUM RESEARCH FUND-AMER CHEM SOC

PW 621 2 FIELD 8F, 8H, 8G, 8C

STANFORD UNIVERSITY, CALIFORNIA

INITIATION, DEVELOPMENT AND MECHANISM OF MEANDERING CHANNELS ON TIDAL FLATS

R. PESTRONG

9/64- 8/65

SOCIETY SIGMA XI + SC RES SOC AMER

PX 324 FIELD 8F, 8H

OHIO WESLEYAN UNIV, UNDERGRADUATE SCHOOL, , OHIO

GLACIAL GEOLOGY OF THE LAKE TASERSIAG AREA, SOUTHWESTERN GREENLAND

H. B. SCHANTZ

5/65- 4/66

AMERICAN ASSOC FOR ADVAN OF SCIENCE

PX 326 FIELD 8D, 8H, 8G

OHIO STATE UNIVERSITY, GRADUATE SCHOOL, GEOLOGY, OHIO

GEOLOGIC HISTORY OF FLAGSTAFF LAKE - E OCENE OF UTAH -

M. P. WEISS

5/65- 4/66

AMERICAN ASSOC FOR ADVAN OF SCIENCE

TL 343 FIELD 8D, 8G

YALE UNIVERSITY, GRADUATE SCHOOL, BIOLOGY, CONNECTICUT

STUDIES OF FOSSIL POLLEN IN SUBTROPICAL SOUTHEASTERN ASIA

M. TSUKADA, K. CHANG, E. S. DEEVEY

3/65- 2/66

AMERICAN PHILOSOPHICAL SOCIETY

UT 465 FIELD 8D, 8G, 7B

UNIVERSITY OF GEORGIA, GRADUATE SCHOOL, GEOLOGY, GEORGIA

THE MORPHOLOGY OF NON-CLASTIC SILICA IN SEDIMENTARY ROCKS

R. E. CARVER

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

WZ 54 FIELD 7D, 8C, 7B

IIT RESEARCH INSTITUTE, AT ILL INST OF TECHNOL, ILLINOIS

CHEMICAL OCEANOGRAPHY RESEARCH

R. S. BRAMAN

/66- /

NO FORMAL SUPPORT

YAL 3 FIELD 8F, 8H, 8G

STATE, GEOL SURVEY, ALABAMA

HYDROLOGY OF LIMESTONE TERRANES

P. E. LAMOREAUX, P. +. LAMOREAUX

WR-1
/66- /

STATE-ALABAMA

YAL 4 FIELD 13B, 8D, 8H, 8G

STATE, GEOL SURVEY, ALABAMA

HYDROLOGY OF SEWAGE STABILIZATION LAGOONS

D. B. KNOWLES, W. J. POWELL

WR-3
/66- /

STATE-ALABAMA

YAL 5 FIELD 13B, 8H

STATE, GEOL SURVEY, ALABAMA

HYDROLOGY OF ALABAMA OIL FIELDS

P. E. LAMOREAUX, P. *. LAMOREAUX
W. J. POWELL

WR-2
/66- /

STATE-ALABAMA

YAL 7 FIELD 8N, 8F, 8H, 8G

STATE, GEOL SURVEY, ALABAMA

WATER RESOURCES OF PIKE COUNTY, ALABAMA

V. M. SHAMBURGER

WR-5
/66- /

STATE-ALABAMA

YAS 35 3 FIELD 8H, 7B

UNIVERSITY OF ARKANSAS, AGRICULTURAL EXPT STA, AGRONOMY, ARKANSAS

MINERAL ANALYSIS OF WATER

G. W. HARDY

ARK-536
/66- /

STATE-ARKANSAS

YCA 350 3 FIELD 13B

UNIV OF CAL-DAVIS, AGRICULTURAL EXPT STA, SOILS + PLANT NUTR, CALIFORNIA

STRESS-DEFORMATION RELATIONSHIP IN SOILS

J. L. MCMURDIE

CAL-D-1964
/66- /

STATE-CALIFORNIA

YCA 379 3 FIELD 8H

UNIV OF CAL-DAVIS, AGRICULTURAL EXPT STA, IRRIGATION, CALIFORNIA

GENERALIZED ANALYSIS OF SMALL WATERSHED RESPONSES

J. AMOROCHO

CAL-D-2080
/66- /

STATE-CALIFORNIA

YCA 489 3 FIELD 8D, 8G, 7B

UNIV OF CAL-RIVERSIDE, AGRICULTURAL EXPT STA, SOILS + PLANT NUTR, CALIFORNIA

ADSORPTION AND EXCHANGE REACTIONS OF POLYVALENT METAL IONS IN CLAYS

N. T. COLEMAN

CAL-R-2026
/66- /

STATE-CALIFORNIA

YCA 752 FIELD 8H, 8C

STATE, RESOURCES AGCY, LOS ANGELES, CALIFORNIA

THE USE OF THE ACOUSTIC VELOCITY METER FOR MEASUREMENT OF NET OUTFLOW FROM THE SACRAMENTO

A. R. GOLZE, A. *. GOLZE
/66- /

STATE-CALIFORNIA

YCA 761 FIELD 8H

STATE, WATER RESOURCES, CALIFORNIA

FLOODS FROM SMALL DRAINAGE AREAS

A. R. GOLZE, W. HOFMANN

/66- /

STATE-CALIFORNIA

YCO 30 3 FIELD 13B, 8H,12A, 8E

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

GROUND WATER TABLE FLUCTUATIONS

M. M. SKINNER

COLO-105
/66- /

STATE-COLORADO

YCO 35 3 FIELD 8H

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

SMALL WATERSHEDS

. NONE

COLO.-111
/66- /

STATE-COLORADO

YCO 37 3 FIELD 8H

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

SMALL WATERSHEDS

V. M. YEVDJEVICH

COLO.-114
/66- /

STATE-COLORADO

YDE 31 FIELD 7C, 7D, 8H, 8C

STATE, WATER POLL COMM, DELAWARE

WATER STUDIES OF THE DELAWARE ESTUARY AND BAY

J. C. BRYSON, J. F. BELL, J. H. HYNSON
M. JACUKOWICZ, K. MCKEE, N. C. VASUKI
J. T. WILBURN

/66- /

STATE-DELAWARE

YDE 38 FIELD 8H, 8C

STATE, GEOL SURV NEWAR, DELAWARE

SALT WATER ENCROACHMENT ALONG THE DELAWARE BAY AND ATLANTIC COAST

R. D. VARRIN

/66- /

STATE-DELAWARE

YFL 358 FIELD 8F, 8H, 8G, 7B

FLA GEOLOGICAL SURVEY, FLORIDA

GEOLOGY AND GROUND-WATER RESOURCES OF LEON COUNTY, FLORIDA

C. W. HENDRY, C. R. SPROUL

/66- /

STATE-FLORIDA

YFL 359 FIELD 8D, 8H, 7B

STATE, CONSERVATION BD, TALLAHASSEE, FLORIDA

GEOLOGY AND WATER RESOURCES OF JEFFERSON COUNTY, FLORIDA

J. W. YON, C. W. HENDRY

/65- /

STATE-FLORIDA

YIL 14 2 FIELD 13B, 8H

STATE, WATER SURV CHGO, ILLINOIS

ASSESSMENT OF EVAPOTRANSPIRATION

O. M. JONES

/66- /

STATE-ILLINOIS

YIL 27 2 FIELD 13G,13B, 8H

STATE, WATER SURV CHGO, ILLINOIS

SEDIMENTATION IN LAKES AND RESERVOIRS

J. B. STALL

/66- /

STATE-ILLINOIS

YIL 28 2 FIELD 13G, 8H

STATE, WATER SURV CHGO, ILLINOIS

NET EVAPORATION, LAKE AND RESERVOIR SURFACES

J. B. STALL

/66- /

STATE-ILLINOIS

YIL 33 2 FIELD 8F, 8N, 8H

STATE, WATER SURV CHGO, ILLINOIS

GROUND-WATER STUDIES - PILOT DRAINAGE BASIN STUDY

R. J. SCHICHT

/66- /

STATE-ILLINOIS

YIL 34 2 FIELD 8H, 8G

STATE, WATER SURV CHGO, ILLINOIS

GROUND-WATER STUDIES - DEEP SANDSTONE AQUIFER IN CHICAGO REGION

R. J. SCHICHT, R. SASMAN

/66- /

STATE-ILLINOIS

YIL 36 2 FIELD 8H, 8+, 9+,12A

STATE, WATER SURV CHGO, ILLINOIS

GEOHYDROLOGIC SYSTEM ANALYSIS WITH AN ELECTRIC ANALOG COMPUTER

R. J. SCHICHT

/66- /

STATE-ILLINOIS

YIL 96 1 FIELD 13B,12A

UNIVERSITY OF ILLINOIS, AGRICULTURAL EXPT STA, AGRONOMY, ILLINOIS

EVALUATION OF SOIL TYPE, SLOPE AND EROSION CONDITIONS OF SOIL ASSOCIATION AREAS AND COUNTIES IN ILLINOIS

E. C. RUNGE

ILL-15-328
/66- /

STATE-ILLINOIS

YIL 195 FIELD 13B, 8F, 8G, 8D

STATE, GEOL SURV URBNA, ILLINOIS

STUDIES IN ENVIRONMENTAL GEOLOGY IN NORTHEASTERN ILLINOIS

J. E. HACKETT, G. M. HUGHES, R. A. LANDON
J. I. LARSEN

/65- /

STATE-ILLINOIS

YIL 199 FIELD 13G, 8H

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

STREAMFLOW VARIABILITY

K. P. SINGH

/66- /

STATE-ILLINOIS

YIL 220 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

STRATIGRAPHY AND SEDIMENTOLOGY OF THE MATTOON FORMATION IN ILLINOIS

M. E. HOPKINS

/65- /

STATE-ILLINOIS

YIL 221 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

HEAVY MINERALS IN THE SANDS OF WABASH RIVER

R. E. HUNTER

/65- /

STATE-ILLINOIS

YIL 222 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

PETROLOGY OF SOME PLEISTOCENE AND RECENT SEDIMENTS

R. E. HUNTER

/65- /

STATE-ILLINOIS

YIL 223 FIELD 8D, 8G, 7B

STATE, GEOL SURV URBNA, ILLINOIS

FELDSPAR-BEARING SANDS OF ILLINOIS

R. E. HUNTER

/65- /

STATE-ILLINOIS

YIL 224 FIELD 8F, 8G

STATE, GEOL SURV URBNA, ILLINOIS

GEOLOGIC MAPPING OF THE DECATUR QUADRANGLE

J. A. LINEBACK, E. ATHERTON, K. E. CLEGG
J. A. SIMON, H. B. WILLMAN

/65- /

STATE-ILLINOIS

YIL 229 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

CHESTERIAN STUDY-PARTS OF FRANKLIN AND WILLIAMSON COUNTIES

H. M. BRISTOL

/65- /

STATE-ILLINOIS

YIL 230 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

STRATIGRAPHY OF CAMBRIAN AND ORDOVICIAN FORMATIONS IN ROCK ISLAND COUNTY, ILLINOIS

T. C. BUSCHBACH

/65- /

STATE-ILLINOIS

YIL 231 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

THE ORIGIN AND GEOLOGIC HISTORY OF HICKS DOME

J. C. BRADBURY

/65- /

STATE-ILLINOIS

YIL 232 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

LITHOSTRATIGRAPHY OF THE HARRODSBURG TO STE. GENEVIEVE LIMESTONE, INCLUSIVE

J. W. BAXTER

/65- /

STATE-ILLINOIS

YIL 233 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

PRECAMBRIAN BASEMENT ROCKS OF ILLINOIS

J. C. BRADBURY

/65- /

STATE-ILLINOIS

YIL 234 FIELD 8D, 7B

STATE, GEOL SURV URBNA, ILLINOIS

BERYLLIUM IN HARDIN COUNTY

J. C. BRADBURY

/65- /

STATE-ILLINOIS

YIL 235 FIELD 8D, 8G,11B

STATE, GEOL SURV URBNA, ILLINOIS

UTILIZATION OF ILLINOIS CLAYS AND SHALES

W. A. WHITE

/65- /

STATE-ILLINOIS

YIL 236 FIELD 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

GEOLOGIC MAPPING OF THE CHICAGO QUADRANGLE

H. B. WILLMAN, J. A. LINEBACK

/65- /

STATE-ILLINOIS

YIL 238 FIELD 8G

STATE, GEOL SURV URBNA, ILLINOIS

STRATIGRAPHY AND PHYSICAL CHARACTER OF THE SUBSURFACE GLACIAL DEPOSITS OF ILLINOIS

J. P. KEMPTON

/65- /

STATE-ILLINOIS

YIL 241 FIELD 8D, 8G, 5A, 7B

STATE, GEOL SURV URBNA, ILLINOIS

ENVIRONMENT OF DEPOSITION OF ARGILLACEOUS SEDIMENTS

N. F. SHIMP, J. A. SCHLEICHER, J. WITTERS

/65- /

STATE-ILLINOIS

YIL 242 FIELD 7D,21D, 8D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

X-RAY FLUORESCENCE ANALYSIS OF GEOLOGIC MATERIALS

N. F. SHIMP, J. WITTERS

/65- /

STATE-ILLINOIS

YIL 243 FIELD 8D, 8H, 8G

STATE, GEOL SURV URBNA, ILLINOIS

CLASSIFICATION OF SILURIAN AND DEVONIAN STRATA IN SOUTHERN ILLINOIS

D. H. SWANN, E. ATHERTON

/65- /

STATE-ILLINOIS

YIL 244 FIELD 8G

STATE, GEOL SURV URBNA, ILLINOIS

THE STRATIGRAPHY OF ILLINOIS

E. ATHERTON, T. C. BUSCHBACH
C. COLLINSON, J. C. FRYE, J. A. SIMON
D. H. SWANN, H. B. WILLMAN

/65- /

STATE-ILLINOIS

## 11. Materials

GYE 220242 1 FIELD 11A,11D,11L,12A

UNIV OF MINNESOTA, AGRICULTURAL EXPT STA, FORESTRY, MINNESOTA

INTERNAL STRESSES DEVELOPED IN GLUE LINES

J. G. HAYGREEN

AG-MINN-MS-1932
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 340235 FIELD 11G

OHIO STATE UNIVERSITY, AGRICULTURAL EXPT STA, HOME ECONOMICS, OHIO

DETERMINATION OF THE MECHANISMS OF FABRIC STRESS ABSORPTION AND PERFORMANCE

M. LAPITSKY, M. R. BUTLER, E. MEACHAM

AG-OHIO-0285
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 620068 2 FIELD 7C, 7D

HEBREW UNIVERSITY IS, ISRAEL

GRAFT COPOLYMERS OF STARCH AND DEXTRIN OBTAINED BY REACTION WITH VINYL MONOMERS AND EPOXIDES

A. ZILKHA

AGF-A-10-UR-0027
/66- /

AGRICULTURE-DEPT OF AGRICULTURE

GYE 620092 1 FIELD 7C, 7A, 7D,11G

HEBREW UNIVERSITY IS, ISRAEL

PROPERTIES OF NEW AZIRIDINYL PHOSPHORUS COMPOUNDS HAVING POTENTIAL FOR USE IN THE TREATMENT OF COTTON

E. D. BERGMANN

AGF-A-10-UR-0056
11/65-10/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 890137 FIELD 11G

TEXT INDUSTRY RES ASSN, INDIA

FACTORS THAT AFFECT THE DIRECT SPINNING SYSTEM OF COTTON

B. R. RAMASWAMY

AGF-A-07-UR-085
1/65-12/65

AGRICULTURE-DEPT OF AGRICULTURE

GYE 890150 FIELD 11G

CENTRAL LEATHER RES., INDIA

CHEMICAL AND PHYSICAL CHANGES TAKING PLACE IN THE RAPID TANNAGE OF HEAVY LEATHERS

S. K. BARAT

AGF-A-07-UR-032
2/65- 1/66

AGRICULTURE-DEPT OF AGRICULTURE

JSM 1 2 FIELD 11G

STANFORD UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CALIFORNIA

FATIGUE OF 66 NYLON AND ITS RELATION TO DYNAMIC MECHANICAL PROPERTIES

C. W. RICHARDS, E. J. SELLEVOLD

7/65- 6/66

SOCONY MOBIL OIL COMPANY

UT 473 FIELD 7D,11F,11G,20L

AUGUSTANA COLLEGE, ILLINOIS

EFFECT OF HYDROGEN ON MAGNETOMECHANICAL DAMPING IN IRON ALLOYS

R. C. FRANK

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

WPC 2 FIELD 7C,12A,20J

POLYMER CORP SARNIA ON, CANADA

ULTRACENTRIFUGAL MEASUREMENT OF MOLECULAR WEIGHT AND MOLECULAR WEIGHT DISTRIBUTION OF SYNTHETIC ELASTOMERS

J. F. HENDERSON, J. HULME, R. M. SMALL
7/65- 6/66

POLYMER CORPORATION LTD

WPC 3 FIELD 7C, 7D, 5A

POLYMER CORP SARNIA ON, CANADA

PHOTOELASTIC PROPERTIES AND TENSILE-ELONGATION OF RUBBERY BLOCK COPOLYMERS

J. F. HENDERSON, E. FISCHER, K. H. GRUNDY
7/65- 6/66

POLYMER CORPORATION LTD

WPC 4 FIELD 7C, 7D,11G,20J

POLYMER CORP SARNIA ON, CANADA

MOLECULAR WEIGHT DISTRIBUTION OF ISOBUTYLENE-ISOPRENE COPOLYMERS AND RHEOLOGICAL PROPERTIES

J. E. MANTON, G. J. WILSON
7/65- 6/66

POLYMER CORPORATION LTD

WPC 6 FIELD 7C, 7D,11G

POLYMER CORP SARNIA ON, CANADA

RELATION OF COMONOMER TYPE AND CONTENT TO GUM FILM TENSILES

R. A. STEWART, C. P. MASON

7/65- 6/66

POLYMER CORPORATION LTD

WPC 7 FIELD 11G, 5A

POLYMER CORP SARNIA ON, CANADA

PERFORMANCE OF EXPERIMENTAL TIRES

E. B. STOREY, G. J. BRIGGS, L. GELINAS

7/65- 6/66

POLYMER CORPORATION LTD

WPC 8 FIELD 11G, 5A

POLYMER CORP SARNIA ON, CANADA

RELATIONSHIP OF TENSILE STRENGTH OF RUBBERS TO VOLUME AND SHAPE OF SPECIMEN

E. B. STOREY, G. J. BRIGGS
7/65- 6/66

POLYMER CORPORATION LTD

WPC 9 FIELD 11G, 5A

POLYMER CORP SARNIA ON, CANADA

PERFORMANCE OF SYNTHETIC ELASTOMERS IN LARGE TRUCK AND AIRCRAFT TIRES

E. B. STOREY, G. J. BRIGGS, J. R. DUNN
L. GELINAS

7/65- 6/66

POLYMER CORPORATION LTD

WPC 10 FIELD 7C, 7D,20M,11G

POLYMER CORP SARNIA ON, CANADA

THE FUNDAMENTAL PROPERTIES OF AN ELASTIC NETWORK

B. M. VANDERHOFF, T. DOLEZAL

7/65- 6/66

POLYMER CORPORATION LTD

YIL 226 FIELD 7D,21D, 8D

STATE, GEOL SURV URBNA, ILLINOIS

TRACE ELEMENTS IN ILLINOIS CRUDE OILS

R. F. MAST, N. F. SHIMP

/65- /

STATE-ILLINOIS

YIL 237 FIELD 8D, 8G,11B,11F

STATE, GEOL SURV URBNA, ILLINOIS

EVALUATION OF ILLINOIS CLAYS AS BINDERS FOR IRON ORE PELLETS

H. W. JACKMAN, R. J. HELFINSTINE
M. B. MIRZA, W. A. WHITE

/65- /

STATE-ILLINOIS

YIL 256 1 FIELD 7C,21D, 7D, 8D

STATE, GEOL SURV URBNA, ILLINOIS

PHYSICAL CHARACTERISTICS OF ILLINOIS CRUDE OIL

W. J. ARMON, T. F. LAWRY, R. F. MAST

/65- /

STATE-ILLINOIS

## 13. Mechanical, Industrial, Civil, and Marine Engineering

GUW 99 FIELD 13G, 5C, 8E,12A

CORNELL UNIVERSITY, SCHOOL OF ENGINEERING, SANITARY ENGINEERING, NEW YORK

DEVELOPMENT OF POLICIES FOR THE CONTROL OF WATER LEVELS IN DEVELOPED RIVER SYSTEMS USING ANALYTICAL MODELS

W. R. LYNN, L. B. DWORSKY, L. M. FALKSON
D. P. LOUCKS

INT-WR-A-002-NY
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 133 FIELD 7D, 8H, 7B

UNIVERSITY OF ALASKA, GRADUATE SCHOOL, CHEMISTRY, ALASKA

CATEGORIZATION OF ORGANIC AND METALLO-ORGANIC CONTAMINANTS OF LOCAL WATER SUPPLIES

N. BIRKHOLZ

INT-WR-A-002-ALAS
/65- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 139 FIELD 13G,20K

WEST VIRGINIA UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WEST VIRGINIA

THE HYDROLOGIC DESIGN OF SMALL DRAINAGE STRUCTURES IN WEST VIRGINIA

J. C. BURCHINAL, W. H. DICKERSON

INT-WR-A-004-WVA
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 145 FIELD 13B, 7D

RUTGERS THE STATE UNIV, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW JERSEY

WATER CONSERVATION THROUGH FILTRATION OF GELATINOUS SLUDGES IN INDUSTRIAL WASTE TR

F. W. DITTMAN

INT-WR-A-004-NJ
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 164 FIELD 13G, 8H, 7B

CLEMSON UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, SOUTH CAROLINA

WATER QUALITY AND WASTE ASSIMILATION CAPACITY STUDIES OF AN IMPOUNDMENT OF RECENT ORIGIN

A. T. WALLACE, A. R. ABERNATHY
J. M. FORD

INT-WR-A-007-SC
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 165 FIELD 13B, 7D

UNIV OF TENNESSEE, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, TENNESSEE

AN INVESTIGATION OF SURFACTANT REMOVAL

M. E. WHATLEY, S. LEE, J. D. SHEPPARD

INT-WR-A-004-TENN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 169 FIELD 13G,13B, 8F, 8H

UNIVERSITY OF NEVADA, GRADUATE SCHOOL, DESERT RESEARCH INST, NEVADA

EVALUATION OF DRAINAGE PROBLEMS IN WATERLOGGED AREAS AND BOLSONS

A. KASHEF

INT-WR-A-002-NEV
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 174 FIELD 13B, 7D, 8H, 7B

UNIV OF RHODE ISLAND, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, RHODE ISLAND

FACTORS AFFECTING SOLUTION OF MANGANESE IN WELL WATER

F. J. DELUISE, H. CAMPBELL

INT-WR-A-003-RI
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 177 FIELD 13B, 8H,10B

UNIV OF CONNECTICUT, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, CONNECTICUT

THE DETERMINATION OF THE ENGINEERING THERMO-PHYSICAL PROPERTIES OF SOLUTIONS CONTAINING DISSOLVED SOLIDS

D. A. FISHER

INT-WR-A-010-CONN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 179 FIELD 13B, 8H

UNIV OF CONNECTICUT, GRADUATE SCHOOL, GEOLOGY + GEOGRAPHY, CONNECTICUT

RATE AND DIRECTION OF GROUND WATER CIRCULATION IN CLOSE SPACED BEDROCK AND GRAVEL WELLS

L. FRANKEL, H. THOMAS

INT-WR-A-005-CONN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 181 FIELD 13G,13B

UNIV OF RHODE ISLAND, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, RHODE ISLAND

THE EFFECT OF OBSTRUCTION ON THE REAERATION OF FLOWING STREAMS

W. H. HAGIST

INT-WR-A-007-RI
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 195 FIELD 13G

UNIV OF CONNECTICUT, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CONNECTICUT

REVERSE FILTER EROSION PROTECTION

C. J. POSEY

INT-WR-A-009-CONN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 196 FIELD 8H,12A, 5C, 8E

UNIVERSITY OF MISSOURI, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MISSOURI

SYSTEMS APPROACH TO RIVER BASIN DEVELOPMENT

A. D. RAY

INT-WR-A-002-MO
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 197 FIELD 13G,20D

UNIV OF CONNECTICUT, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CONNECTICUT

REDUCTION OF RIVER HEAT POLLUTION BY TURBULENCE STIMULATION

V. E. SCOTTRON

INT-WR-A-011-CONN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 199 FIELD 13B, 7D, 7C

IOWA ST UNIV SCI TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, IOWA

THE BIODEGRADABILITY AND THE CHEMICAL OXIDATION OF CARBON-ADSORBED MATERIALS FROM EFFLUENTS FROM SEWAGE PLANTS

O. SLETTEN
INT-WR-A-007-IA
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 201 FIELD 13B

, UNKNOWN STATE AND IN

INDIVIDUAL WASTE DISPOSAL SYSTEMS
INT-WR-A-001-CONN
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 207 FIELD 8F, 8H,12A, 8E

PURDUE UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, INDIANA

STATISTICAL ANALYSIS OF GROUNDWATER USE AND REPLENISHMENT

R. B. JOHNSON, N. R. AUGMENBAUGH
INT-A-002-IND
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

GUW 211 FIELD 13G,13B

UNIV OF PUERTO RICO, AGRICULTURAL EXPT STA, PUERTO RICO

DEVELOPMENT OF GROUND-WATER CONTROL METHODS HEAVY SOILS

R. VAZQUEZ, M. A. NEGRON, C. T. RAMIREZ
S. WISCOVICH
INT-A-004-PR
6/63- 6/66

INTERIOR-OFFICE OF WATER RESOURCES

GUW 216 FIELD 13B

KANSAS ST UNIV AGR SCI, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, KANSAS

OPTIMAL AERATION SYSTEMS
L. E. ERICKSON, L. FAN

INT-B-001-KAN
9/65- 8/66

INTERIOR-OFFICE OF WATER RESOURCES

GW 1651 1 FIELD 13M

HOFSTRA UNIVERSITY, NEW YORK

DEVELOPMENT AND EVALUATION OF AN INEXPENSIVE, EASILY-INSTALLED ELEVATOR FOR PUBLIC BUILDINGS

H. E. YUKER, R. J. SULLIVAN

RD-1651-G
8/65- 7/66

HEW-OFFICE OF VOCATIONAL REHAB

GYE 20114 3 FIELD 13B, 8F, 8H

UNIVERSITY OF ARIZONA, AGRICULTURAL EXPT STA, WATERSHED MANAGEMENT, ARIZONA

THE DISPOSITION OF SOIL MOISTURE ON A SEMI-DESERT WATERSHED
S. D. RESNICK

AG-ARIZ-0559
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 40230 1 FIELD 11F,11G,11L,20L

UNIV OF CAL-BERKELEY, AGRICULTURAL EXPT STA, FORESTRY, CALIFORNIA

WOOD MACHINING

F. E. DICKINSON

AG-CAL-MS-F-2181
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 290002 3 FIELD 13G,13B, 8H

RUTGERS THE STATE UNIV, AGRICULTURAL EXPT STA, SOILS, NEW JERSEY

SOIL DRAINAGE

R. B. ALDERFER

AG-NJ-0010
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 370277 1 FIELD 11A,11D,11L

PENNSYLVANIA ST UNIV, AGRICULTURAL EXPT STA, FORESTRY, PENNSYLVANIA

KERFLESS CUTTING WITH A KNIFE

W. K. MURPHEY, R. E. MCDERMOTT

AG-PA-1492
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

GYE 39000d 3 FIELD 13G,13B, 8H

CLEMSON UNIVERSITY, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, SOUTH CAROLINA

WATER YIELDS FROM SHALLOW GROUND AQUIFERS

T. V. WILSON

AG-SC-0056
7/65- 6/66

AGRICULTURE-DEPT OF AGRICULTURE

JMD 1 FIELD 13G,13F,12A, 5C

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

MODEL STUDIES OF A PROPOSED BARRAGE ACROSS THE WISCONSIN RIVER AT MUSCODA, WISCONSIN

J. R. VILLEMONTE, P. L. MONKMEYER
P. UTIORMARK

/66- /

MUSCODA ADVANCEMENT CORPORATION

NAZ 25 FIELD 13G,20D

UNIVERSITY OF ARIZONA, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, ARIZONA

SCOUR AT RELIEF BRIDGES

E. M. LAURSEN
/66- /

ARIZONA, UNIVERSITY OF

NCA 2 FIELD 13B,12A, 5C

UNIV OF CAL-BERKELEY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CALIFORNIA

ECONOMIC EVALUATION OF WATER

P. H. MCGAUHEY
/66- /

CALIFORNIA, UNIVERSITY OF-ALL BRANCHES

NGI 1 FIELD 13B

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

CHARACTERISTICS OF ENGINEERING SOILS SUBJECTED TO PLANE STRAIN CONDITIONS + 3 INDEPENDENT PRINCIPAL STRESSES

N. H. WADE, G. F. SOWERS
/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 8 FIELD 13B, 5A

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

A SURVEY OF WASTE TREATMENT FACILITIES IN GEORGIA

F. G. POHLAND

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 9 FIELD 13B

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

A STUDY OF THE USE OF STABILIZATION PONDS IN THE SOUTHEAST

F. G. POHLAND
/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 14 FIELD 13B

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

COST ANALYSIS OF WATER AND WASTE TREATMENT PROCESSES

W. E. GATES

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 15 FIELD 13B

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

GROWTH KINETICS IN CONTINUOUS FLOW, COMPLETE MIX AEROBIC BIO-SYSTEMS

W. E. GATES
/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NGI 16 FIELD 13B

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

COMPLETE-MIX ANAEROBIC SLUDGE SYSTEM FOR RAW WASTE TREATMENT

W. E. GATES

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NIN 8 FIELD 13G, 8H

INDIANA UNIVERSITY, GRADUATE SCHOOL, GEOLOGY, INDIANA

THERMAL POLLUTION OF WHITE RIVER IN THE VICINITY OF THE PETERSBURG GENERATING STATION, PIKE COUNTY, INDIANA

A. F. AGNEW, M. PROFFITT
/66- /

INDIANA UNIVERSITY

NMN 1 FIELD 13G,13B, 9+,12A

MONTANA STATE COLLEGE, SCHOOL OF ENGINEERING, CIV ENGIN + ENGIN MECH, MONTANA

EVALUATION OF HYDROLOGIC INSTRUMENTATION ON MAYNARD CREEK WATERSHED + SELECTION OF WATERSHEDS FOR INTENSIVE ENGINEERING HYDROLOGY ST

T. T. WILLIAMS, E. R. DODGE
/66- /

MONTANA STATE UNIVERSITY

NMO 2 FIELD 13G,13F

UNIVERSITY OF MISSOURI, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MISSOURI

HYDRAULIC CHARACTERISTICS OF HIGHWAY GRATE-INLETS

J. J. CASSIDY
/66- /

MISSOURI, UNIVERSITY OF

NMT 5 FIELD 13G,12A, 5C,13M

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MASSACHUSETTS

MINIMUM-COST DESIGN OF PIPE NETWORKS

R. T. MCLAUGHLIN
/66- /

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NMT 8 FIELD 20M,10B

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MASSACHUSETTS

TECHNIQUES OF MODELLING THE SOLAR POND IN THE LABORATORY

D. R. HARLEMAN
/66- /

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NNC 3 FIELD 13G, 8H,12A,20D

UNIV OF NORTH CAROLINA, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, NORTH CAROLINA

STREAMFLOW ROUTING ON DIGITAL COMPUTER BY THE METHOD OF CHARACTERISTICS

M. AMEIN
/65- /

NORTH CAROLINA STATE UNIVERSITY

NST 10 FIELD 13G

STANFORD UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CALIFORNIA

OPTIMUM OPERATION OF A MULTI-RESERVOIR WATER SUPPLY SYSTEM

J. B. FRANZINI, R. AMIR, W. LINVILL

7/65- 6/66

STANFORD UNIVERSITY

NTA 3 FIELD 13F,11B, 5C,13M

TEXAS A + M UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, TEXAS

THE USE OF WASTE BATTERY BOXES AS A PAVING MATERIAL

B. M. GALLAWAY, B. R. SCHLAPAK

/65- /

TEXAS A + M UNIVERSITY

NTA 12 FIELD 13B, 7D, 7B

TEXAS A + M UNIVERSITY, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, TEXAS

THE RENOVATION OF WASTE WATER BY THE DIRECT OXIDATION OF DISSOLVED ORGANIC MATTER WITH OZONE

R. R. DAVISON
6/65- 5/66

TEXAS A + M UNIVERSITY

NWS 14 FIELD 13G

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

MUSCODA BARRAGE PROJECT

J. R. VILLEMONTE, M. DORL, E. LEONHARDT H. MAJUMDAR, P. L. MONKMEYER, J. ORSBURN P. UTTORMARK
/66- /

WISCONSIN, UNIVERSITY OF

PIK 1 FIELD 13B, 8H, 7B

WEST VIRGINIA UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WEST VIRGINIA

FATE OF NITROGENOUS WASTES IN THE KANAWHA RIVER, W. VA

C. R. JENKINS, J. PATTON
1/65- 9/66

INDUSTRIAL ADVISORY COMM KANAWHA VALLEY

PSD 1 FIELD 13B, 7D, 7B

PENNSYLVANIA ST UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, PENNSYLVANIA

LITERATURE SURVEY OF THE METHODS OF REMOVING PHOSPHORUS FROM MUNICIPAL SEWAGE TREATMENT PLANT EFFLUENTS

J. B. NESBITT
/66- /

SOAP + DETERGENTS ASSOCIATION

WI 55 FIELD 13G, 8H

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

FLOOD ROUTING ON THE LOWER WISCONSIN RIVER

A. T. LENZ, R. S. MCLEOD
/66- /

NO FORMAL SUPPORT

XER 1 FIELD 13B

PENNSYLVANIA ST UNIV, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, PENNSYLVANIA

AN INVESTIGATION OF HIGH RATE WATER FILTRATION

J. B. NESBITT, W. DEARMANT, J. *. NESBITT F. RICE, G. G. ROBECK
/66- /

CITY-ERIE-PENNSYLVANIA

XZ 785 1 FIELD 13B

UNIV OF SASKATCHEWAN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CANADA

ANAEROBIC LAGOONS - A FIELD AND LABORATORY STUDY OF THEIR EFFICIENCY AND LIMITATIONS IN SEWAGE TREATMENT

C. R. FORSBERG

607-7-54
7/65- 6/66

CANADA-DEPT OF NATL HEALTH + WELFARE

XZ 808 1 FIELD 13B

NOVA SCOTIA TECH COLL, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, CANADA

DISINFECTION AND RETENTION OF COMBINED SEWAGE

D. H. WALLER

602-7-58
7/65- 6/66

CANADA-DEPT OF NATL HEALTH + WELFARE

YAL 6 FIELD 13G,13B,13F, 7D

STATE, GEOL SURVEY, ALABAMA

DETRIMENTAL EFFECTS OF NATURAL SOIL AND WATER ELEMENTS ON THE CULVERT PIPE AND DRAINAGE STRUCTURES IN ALABAMA

L. W. HYDE

WR-4
/65- /

STATE-ALABAMA

YAR 41 FIELD 13G,13B, 8H

UNIVERSITY OF ARIZONA, AGRICULTURAL EXPT STA, WATERSHED MANAGEMENT, ARIZONA

EVAPORATION AND SEEPAGE CONTROL FROM SMALL RESERVOIRS

C. B. CLUFF, C. *. CLUFF, M. M. FOGEL

/65- /

STATE-ARIZONA

YAS 80 FIELD 13G,13B

UNIVERSITY OF ARKANSAS, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, ARKANSAS

HYDROLOGIC PLANNING STUDIES

L. R. HEIPLE, W. G. FRANCIS

7/65- 6/66

STATE-ARKANSAS

YCA 651 FIELD 13B, 7A, 7D, 7B

ENGINEERING SCI INC, OAKLAND, CALIFORNIA

RESEARCH ON THE PRODUCTION AND MOVEMENT OF GASES PRODUCED BY DECOMPOSING REFUSE

H. F. LUDWIG, W. BISHOP, F. BOWERMAN R. CARTER, J. SCHERFIG, T. WU

/65- /

STATE-CALIFORNIA

YCA 751 FIELD 13G, 8H, 8C,13B

UNIV OF CAL-BERKELEY, SCHOOL OF ENGINEERING, CALIFORNIA

SACRAMENTO-SAN JOAQUIN DELTA ANALOG MODEL STUDIES

A. R. GOLZE, J. FIELDS, A. *. GOLZE J. HARDER, J. O. NELSON

/66- /

STATE-CALIFORNIA

YCA 753 FIELD 13G

UNIV OF CAL-DAVIS, SCHOOL OF AGRICULTURE, IRRIGATION, CALIFORNIA

FLOW CONVEYANCE EFFICIENCY OF TRANSITION AND CHECK STRUCTURE IN A TRAPEZOIDAL CHANNEL

J. AMOROCHO, A. BABB, A. R. GOLZE

/66- /

STATE-CALIFORNIA

YCA 755 FIELD 13G,20D,20K,10B

STATE, RESOURCES AGCY, LOS ANGELES, CALIFORNIA

CALIFORNIA AQUEDUCT, NORTH SAN JOAQUIN DIVISION, FISH PROTECTIVE FACILITY

A. R. GOLZE, J. AMOROCHO, A. BABB D. DAVIS, A. *. GOLZE, D. D. HODGE H. C. HYDE

/66- /

STATE-CALIFORNIA

YCA 758 FIELD 13G,20L,20K

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, MASSACHUSETTS

MODEL STUDIES OF FOUNDATION PROBLEMS OF CONCRETE DAMS

A. R. GOLZE, A. *. GOLZE, J. L. SERAFIM

/65- /

STATE-CALIFORNIA

YCA 762 FIELD 13B, 8H,12A, 5C

STATE, WATER RESOURCES, CALIFORNIA

PLANNED UTILIZATION OF GROUNDWATER BASINS - SAN JOAQUIN VALLEY

A. R. GOLZE, A. A. SWANSON

/65- /

STATE-CALIFORNIA

YCA 763 FIELD 13G,10B

UNIV OF CAL-DAVIS, SCHOOL OF AGRICULTURE, , CALIFORNIA

HYDRAULIC MODEL STUDIES OF SIPHON OUTLETS FOR PUMPING PLANT DISCHARGE LINES

A. R. GOLZE, J. AMOROCHO, A. BABB A. *. GOLZE

/66- /

STATE-CALIFORNIA

YCA 764 FIELD 13G, 8H,12A, 9D

DANIEL MANN JOHNSON, CALIFORNIA

DEVELOPMENT OF AN OPERATIONS CONTROL PLAN

A. R. GOLZE, A. L. CASPER, C. B. FOWLER A. *. GOLZE, W. R. MADSEN, G. PAPATHAKIS

7/65- 6/66

STATE-CALIFORNIA

YCA 767 FIELD 13G,20D,20K

UNIV OF CAL-DAVIS, SCHOOL OF AGRICULTURE, IRRIGATION, CALIFORNIA

RADIAL GATE DISCHARGE COEFFICIENT MODEL STUDY

J. AMOROCHO, A. BABB, A. R. GOLZE

/66- /

STATE-CALIFORNIA

YCA 768 FIELD 13G,12A,20D

UNIV OF CAL-DAVIS, SCHOOL OF AGRICULTURE, , CALIFORNIA

HYDRAULIC TRANSIENTS IN THE CALIFORNIA AQUEDUCT

A. R. GOLZE, J. AMOROCHO, A. R. GOLZE T. STRELKOFF

/66- /

STATE-CALIFORNIA

YCO 31 3 FIELD 13G,14B

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

MEASUREMENT OF WATER

D. B. SIMONS

COLO.-106
/66- /

STATE-COLORADO

YCO 32 3 FIELD 13G, 8G

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

SEALING OF CANALS

R. D. DIRMEYER

COLO.-108
/66- /

STATE-COLORADO

YDE 29 FIELD 13B, 8H

STATE, WATER POLL COMM, DELAWARE

DRAINAGE BASIN STUDIES

J. C. BRYSON, J. F. BELL, J. H. HYNSON M. JACUKOWICZ, K. MCKEE, N. C. VASUKI J. T. WILBURN

/66- /

STATE-DELAWARE

YDE 30 FIELD 13B

STATE, WATER POLL COMM, DELAWARE

SHORELINE DISPERSION OF WASTE EFFLUENTS AND TRIBUTARY STREAMS

J. C. BRYSON, J. F. BELL, J. H. HYNSON N. C. VASUKI, J. T. WILBURN

/66- /

STATE-DELAWARE

YDE 34 FIELD 13B, 8H, 8C

STATE, WATER POLL COMM, DELAWARE

WASTE ASSIMILATION CHARACTERISTICS OF ESTUARIES

J. C. BRYSON, J. F. BELL, J. H. HYNSON M. JACUKOWICZ, K. MCKEE, N. C. VASUKI J. T. WILBURN

/66- /

STATE-DELAWARE

YDE 37 FIELD 8H

STATE, GEOL SURV NEWAR, DELAWARE

WATER RESOURCES OF DELAWARE NORTH OF CHESAPEAKE AND DELAWARE CANAL

R. D. VARRIN
/66- /

STATE-DELAWARE

YIL 13 2 FIELD 13G,12A,14B,20D

STATE, WATER SURV CHGO, ILLINOIS

HYDRAULIC DESIGN OF DROP-INLET SPILLWAY STRUCTURES FOR SMALL RESERVOIRS

H. W. HUMPHREYS

/66- /

STATE-ILLINOIS

YIL 15 2 FIELD 13B,11F,10B

STATE, WATER SURV CHGO, ILLINOIS

COOLING TOWER TREATMENT

R. W. LANE

/66- /

STATE-ILLINOIS

YIL 191 1 FIELD 13G,13F, 8D,20K

STATE, GEOL SURV URBNA, ILLINOIS

ENGINEERING GEOLOGY

W. C. SMITH

/65- /

STATE-ILLINOIS

YIL 197 FIELD 13B, 8H, 8E,12A

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

POTENTIAL YIELD OF SAND AND GRAVEL AQUIFERS

T. A. PRICKETT

/66- /

STATE-ILLINOIS

YIL 198 FIELD 8H,12A, 8E

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

SELECTED TYPE-CURVE METHODS FOR AQUIFER TEST ANALYSIS

R. J. SCHICHT, A. P. VISOCKY

/66- /

STATE-ILLINOIS

YIL 200 FIELD 8H

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

INTERRELATIONSHIP OF FACTORS AFFECTING QUALITY OF IMPOUNDED WATERS

R. L. EVANS

/66- /

STATE-ILLINOIS

YIL 203 FIELD 13B, 8H

STATE, WATER SURV UBNA, URBANA-WATER SURVEY DV, ILLINOIS

EFFECT OF COARSE FILTER MEDIA ON ARTIFICIAL RECHARGE

R. L. EVANS, R. L. THOMAS

/66- /

STATE-ILLINOIS

YIO 6 FIELD 13B

IOWA ST UNIV SCI TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, IOWA

EVALUATION OF SEDIMENTATION TANK PERFORMANCE BY MODEL ANALYSIS

P. E. MORGAN, E. K. BAUMANN J. L. CLEASBY

/66- /

STATE-IOWA

YIO 7 FIELD 13B,12A,13M, 8E

IOWA ST UNIV SCI TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, IOWA

EVALUATION OF FILTRABILITY OF WATER ON A THIN GRANULAR FILTER

J. L. CLEASBY, D. M. FOX

/66- /

STATE-IOWA

YKA 91 3 FIELD 7C, 7D, 7B

KANSAS ST UNIV AGR SCI, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, KANSAS

PRODUCTION OF HIGHLY PALATABLE WATER FROM AIR FOR HOUSEHOLD, LIVESTOCK, AND INDUSTRIAL USE

R. C. HALL

KAN-583
/66- /

STATE-KANSAS

YMO 3 FIELD 8H

MISSOURI STATE GEOL., MISSOURI

FIELD CONTROL DATA FOR WELL INFORMATION

K. BROWNING, D. L. FULLER, M. LUND

/66- /

STATE-MISSOURI

YMO 4 FIELD 8H,10B

MISSOURI STATE GEOL., MISSOURI

TEMPERATURE GRADIENT

D. L. FULLER, K. BROWNING, M. LUND

/66- /

STATE-MISSOURI

YMO 7 FIELD 8H

MISSOURI STATE GEOL., MISSOURI

WATER QUALITY STUDIES

M. E. PHILLIPS, K. ANDERSON, D. L. FULLER R. KNIGHT, J. WELLS

/66- /

STATE-MISSOURI

YMO 10 FIELD 13G, 8F, 8H, 8G

MISSOURI STATE GEOL., MISSOURI

LAKE SITE FEASIBILITY STUDIES

J. MARTIN, J. WILLIAMS

/66- /

STATE-MISSOURI

YMO 11 FIELD 13B, 8N, 8H, 8G

MISSOURI STATE GEOL., MISSOURI

POLLUTION ABATEMENT

J. MARTIN, R. KNIGHT, J. WILLIAMS

/66- /

STATE-MISSOURI

YMO 17 FIELD 13B

UNIVERSITY OF MISSOURI, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MISSOURI

THE METABOLIC DEGRADATION OF MATERIALS WITHIN WASTE STABILIZATION LAGOONS

D. L. KING, A. D. RAY

/66- /

STATE-MISSOURI

YMO 18 FIELD 13B, 7D

UNIVERSITY OF MISSOURI, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, MISSOURI

THE EFFECT OF PLATING AND METALLURGICAL PROCESS WASTE ON STABILIZATION LAGOONS

R. H. LUEBBERS, L. J. MURPHY

/66- /

STATE-MISSOURI

YMO 19 FIELD 8H,12A, 8E

UNIVERSITY OF MISSOURI, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MISSOURI

REDUCTION AND CORRELATION OF DATA FROM WATER QUALITY MONITORING FACILITIES

R. WHEELER, A. D. RAY

/66- /

STATE-MISSOURI

## 14. Methods and Equipment

NG 80 FIELD 13B, 9A,12A,13M

PURDUE UNIVERSITY, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, INDIANA

DEVELOPMENT OF VELOCITY VECTOR TRANSDUCER

G. H. TUEBES, M. A. PERU
/66- /

PURDUE UNIVERSITY

YIL 16 2 FIELD 11B,11F,11G,10B

STATE, WATER SURV CHGO, ILLINOIS

EVALUATION OF CORROSION RATE TESTERS

R. W. LANE
/66- /

STATE-ILLINOIS

## 18. Nuclear Science and Technology

GUW 171 FIELD 18G, 7D, 7B

UNIV OF RHODE ISLAND, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, RHODE ISLAND

ANALYSIS OF THE EFFLUENT FROM A NUCLEAR FUEL RECOVERY PLANT

S. S. BLECHARCZYK, D. M. ROSIE

INT-WR-A-004-RI
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

NWA 44 1 FIELD 7D, 5A,18A,20H

WASHINGTON STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, WASHINGTON

ACTIVATION ANALYSIS AND NUCLEAR DECAY SCHEME STUDIES

W. A. CASSATT, E. S. MURPHY, J. RIEHL

3/65- 2/66

WASHINGTON STATE UNIVERSITY

NWA 57 1 FIELD 5A,18A, 7D

WASHINGTON STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, WASHINGTON

GAMMA-GAMMA ANGULAR CORRELATION MEASUREMENTS

W. A. CASSATT, E. S. MURPHY

3/65- 2/66

WASHINGTON STATE UNIVERSITY

XZ 800 1 FIELD 5A,18A

UNIV OF TORONTO, GRADUATE SCHOOL, PHYSICS, CANADA

STUDIES ON NUCLEAR RADIATION

K. G. MCNEILL

605-7-239
7/65- 6/66

CANADA-DEPT OF NATL HEALTH + WELFARE

## 20. Physics

GPF 505 2 FIELD 11F,11G,20C, 5A

UNIV OF MISSISSIPPI, GRADUATE SCHOOL, PHYSICS + ASTRONOMY, MISSISSIPPI

THE EFFECTS OF NEUTRON IRRADIATION ON THE ELECTRONIC PROPERTIES OF BINARY ALLOYS

A. B. LEWIS, R. T. ARNOLD, L. N. BOLEN
A. B. CULLEN

AT-40-1-2891
9/64- 9/65

AEC-DIVISION OF PHYSICAL RES

GPF 573 1 FIELD 18A, 7D, 7B

STATE UNIV N Y STONY, UNDERGRADUATE SCHOOL, CHEMISTRY, NEW YORK

NUCLEAR REACTION STUDIES

J. M. ALEXANDER, P. D. CROFT
J. B. NATOWITZ

AT-30-1-3403
6/65- 5/66

AEC-DIVISION OF PHYSICAL RES

GPF 575 3 FIELD 12A,20H,20I

STUDY OF ANOMALOUS CROSS-FIELD DIFFUSION

O. BUNEMAN, J. BROWNELL, R. HOCKNEY
J. HOSEA, L. LINSON, D. PIGACHE
E. POWERS

AT-04-3-326
5/65-10/66

AEC-DIVISION OF PHYSICAL RES

GPF 728 6 FIELD 20C,20I

UNIV OF TENNESSEE, GRADUATE SCHOOL, PHYSICS + ASTRONOMY, TENNESSEE

INSTABILITIES DUE TO ANISOTROPIC VELOCITY DISTRIBUTIONS

E. G. HARRIS, O. C. ELDRIDGE

AT-40-1-2598
9/65- 8/66

AEC-DIVISION OF PHYSICAL RES

GPF 745 2 FIELD 5A,18A,20H,20J

UNIV OF CAL-LA JOLLA, GRADUATE SCHOOL, PHYSICS, CALIFORNIA

PROBLEMS IN THEORETICAL NUCLEAR PHYSICS MANY-BODY SYSTEMS

S. J. ADAMS, K. A. BRUECKNER, N. M. KROLL

AT-11-1-GEN-10-11
10/64- 9/65

AEC-DIVISION OF PHYSICAL RES

GPF 824 FIELD 7D,20J,20C,18A

UNIV OF PITTSBURGH, GRADUATE SCHOOL, CHEMISTRY, PENNSYLVANIA

RECOIL STUDIES OF NUCLEAR REACTIONS

R. L. WOLKE, S. GANGADHARAN
J. B. NATOWITZ, F. PEMENT, C. SCHAEF
M. A. VOLKAR

AT-30-1-2771
4/65- 4/66

AEC-DIVISION OF PHYSICAL RES

GPF 825 FIELD 7D,18A,20J

UNIV OF PITTSBURGH, GRADUATE SCHOOL, CHEMISTRY, PENNSYLVANIA

RECOIL STUDIES OF NUCLEAR REACTIONS

R. L. WOLKE, S. GANGADHARAN
J. B. NATOWITZ, F. PEMENT, C. SCHAEF
M. A. VOLKAR

AT-30-1-2771
4/65- 4/66

AEC-DIVISION OF PHYSICAL RES

GPF 831 FIELD 5A,20L, 7B

ILLINOIS INST OF TECH, GRADUATE SCHOOL, PHYSICS, ILLINOIS

IRRADIATION EFFECTS ON KCl SURFACE MECHANICAL PROPERTIES

L. I. GROSSWEINER, T. K. BHATTACHARYA
G. M. JIRGAL, E. F. ZWICKER

AT-11-1-1052
6/65- 6/66

AEC-DIVISION OF PHYSICAL RES

GPF 837 FIELD 12A, 5A,20H,20J

UNIV OF CAL-RIVERSIDE, GRADUATE SCHOOL, PHYSICS, CALIFORNIA

SELF-CONSISTENT DETERMINATION OF REGGE PARAMETERS

P. E. KAUS, W. J. ABBE, C. J. PEARSON

AT-11-1-34-107
5/65- 8/65

AEC-DIVISION OF PHYSICAL RES

GPF 846 FIELD 18A, 7D, 7B

CLARK UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, MASSACHUSETTS

ISOMERIC RATIOS IN COMPOUND NUCLEAR REACTIONS



799-657 O - 66 C

T. T. SUGIHARA, V. P. NARANG
J. O. RASMUSSEN

AT-30-1-1930
6/65- 5/66

AEC-DIVISION OF PHYSICAL RES

GPF 855 1 FIELD 5A,18A,20H,20J

SYRACUSE UNIVERSITY, GRADUATE SCHOOL, PHYSICS, NEW YORK

RESEARCH PROGRAM IN ELEMENTARY PARTICLE THEORY

E. G. SUDARSHAN, A. P. BALACHANDRAN
I. P. GYUK, M. Y. HAN, A. J. MACFARLANE
L. S. ORAIFEARTAIGH, G. PINSKI

AT-30-1-3399
6/65- 1/66

AEC-DIVISION OF PHYSICAL RES

GPF 859 FIELD 12A,20H, 5A, 7D

SYRACUSE UNIVERSITY, GRADUATE SCHOOL, PHYSICS, NEW YORK

ALGEBRAIC TABLES OF THE CLEBSCH-GORDAN COEFFICIENTS OF SU3 FOR THE DIRECT PRODUCT - N.U. - X - 1.1 - OF REPRESENTATIONS OF SU3

E. C. SUDARSHAN, J. G. KURIYAN
A. J. MACFARLANE

AT-30-1-3399
6/64- 5/65

AEC-DIVISION OF PHYSICAL RES

GPF 869 FIELD 7A, 7D,20M,11F

UNIVERSITY OF MICHIGAN, SCHOOL OF ENGINEERING, CHEMICAL + METAL ENGIN, MICHIGAN

THERMODYNAMICS OF LIQUID METALLIC SOLUTIONS

R. D. PEHLKE

AT-11-1-1352
12/64-11/65

AEC-DIVISION OF PHYSICAL RES

GPF 882 FIELD 7D,11F,11G,12A

UNIVERSITY OF OKLAHOMA, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, OKLAHOMA

DIFFUSION IN BINARY LIQUID METAL SYSTEMS

F. B. CANFIELD

AT-40-1-3396
5/65- 4/66

AEC-DIVISION OF PHYSICAL RES

GPF 890 FIELD 9+,11B,20J,20C

COLUMBIA UNIVERSITY, SCHOOL OF ENGINEERING, ELECTRICAL ENGINEERING, NEW YORK

ELECTRONIC PROPERTIES OF REFRACTORY MONOXIDES HAVING INTRINSIC LATTICE VACANCY CONCENTRATIONS

S. P. DENKER

AT-30-1-3553
6/65- 5/66

AEC-DIVISION OF PHYSICAL RES

GPF 895 FIELD 20I

UNIVERSITY OF MARYLAND, SCHOOL OF ENGINEERING, FLUID DYNAM + AP MATH, MARYLAND

INVESTIGATION OF UNIVERSAL PLASMA INSTABILITIES

H. LASHINSKY

AT(40-1)3405
6/65- 5/66

AEC-DIVISION OF PHYSICAL RES

GPF 897 FIELD 7D, 7A,20D,10B

COLUMBIA UNIVERSITY, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW YORK

VISCOSITY OF ALKALI METAL VAPORS

C. F. BONILLA, D. I. LEE

AT-30-1-2660
6/65- 5/66

AEC-DIVISION OF PHYSICAL RES

GPF 899 FIELD 7A, 7D,20M,20D

COLUMBIA UNIVERSITY, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW YORK

VELOCITY DISTRIBUTION IN FALLING LIQUID FILMS

C. F. BONILLA, F. CASTELLANA

AT-30-1-2660
6/65- 5/66

AEC-DIVISION OF PHYSICAL RES

GSE 114 4 FIELD 20M,20D

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, MASSACHUSETTS

FILM BOILING INSIDE OF TUBES

W. M. ROHSENOW

NSF-GP-1245
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 583 1 FIELD 11G,20L

UNIVERSITY OF COLORADO, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, COLORADO

VISCOELASTIC-PLASTIC BEHAVIOR OF SOLIDS

W. G. GOTTENBERG

NSF-GK-24
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 584 1 FIELD 20D

PRINCETON UNIVERSITY, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, NEW JERSEY

COMPRESSIBILITY EFFECTS IN GAS-LIQUID MIXTURES

R. EICHHORN

NSF-GK-22
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 602 1 FIELD 20K

UNIVERSITY OF COLORADO, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, COLORADO

CONTACT PROBLEMS IN PLATES AND SHELLS

F. ESSENBURG

NSF-GK-21
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 606 1 FIELD 7C, 7D, 8G,11G

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, METALLURGY, MASSACHUSETTS

HYSTERESIS OF CONTACT ANGLES AT SOLID SURFACES

A. M. GAUDIN
NSF-GK-44
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 609 1 FIELD 20D

STANFORD UNIVERSITY, SCHOOL OF ENGINEERING, AERONAUT + ASTRONAUT, CALIFORNIA

JET STABILITY AND RELATED EDGE-TONE GENERATION

K. KARAMCHETI
NSF-GK-32
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 613 1 FIELD 7D,12A

NEW YORK UNIVERSITY, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW YORK

MOMENTUM, HEAT AND MASS TRANSFER FROM ANISTROPIC BODIES

H. BRENNER
NSF-GK-56
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 617 1 FIELD 20D

VIRGINIA POLYTECH INST, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, VIRGINIA

FLUID JET CONTROL

R. A. COMPARIN
NSF-GK-34
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 620 1 FIELD 20K

SYRACUSE UNIVERSITY, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, NEW YORK

COMPLEMENTARY ENERGY METHODS FOR FINITE DEFORMATION

C. LIBOVE
NSF-GK-51
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 622 1 FIELD 7A, 7D

UNIV OF MINNESOTA, GRADUATE SCHOOL, CHEMICAL ENGINEERING, MINNESOTA

INTERFACE MECHANICS

L. E. SCRIVEN
NSF-GK-41
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSE 623 1 FIELD 20M,11G,11F,20J

SYRACUSE UNIVERSITY, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, NEW YORK

SPECIFIC HEAT MEASUREMENTS OF TRANSITION ELEMENT ALLOYS

K. SCHRUDER
NSF-GK-52
9/65- 9/66

NSF-ENGINEERING SCIENCES DIVISION

GSP 79 4 FIELD 20C, 5A,18A,20L

HARVARD UNIVERSITY, GRADUATE SCHOOL, PHYSICS, MASSACHUSETTS

NUCLEAR ORIENTATION

F. M. PIPKIN

NSF-GP-3388
9/65- 8/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 87 2 FIELD 20M,11F,20J,20C

UNIVERSITY OF ILLINOIS, GRADUATE SCHOOL, PHYSICS, ILLINOIS

PROPERTIES OF MATTER AT LOW TEMPERATURES

J. C. WHEATLEY

NSF-GP-3586
10/64-10/65

NSF-PHYSICAL SCIENCES DIVISION

GSP 115 3 FIELD 5A,20H, 7D

NEW YORK UNIVERSITY, GRADUATE SCHOOL, PHYSICS, NEW YORK

ELEMENTARY PARTICLE THEORY

B. ZUMINO, J. BERNSTEIN, G. FRYE
M. A. RUDERMAN, A. SIRLIN

NSF-GP-2416
7/64- 6/65

NSF-PHYSICAL SCIENCES DIVISION

GSP 367 4 FIELD 20M, 8D, 8G, 8K

UNIVERSITY OF CHICAGO, GRADUATE SCHOOL, GEOPHYSICAL SCIENCES, ILLINOIS

THE PHYSICAL BEHAVIOR OF SOLIDS UNDER VERY HIGH PRESSURES

J. C. JAMIESON

NSF-GP-3351
8/65- 8/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 558 4 FIELD 7D,20C, 7B

UNIVERSITY OF CHICAGO, GRADUATE SCHOOL, INST FOR STUDY METALS, ILLINOIS

FIELD EMISSION

R. GOMER

NSF-GP-3360
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 858 3 FIELD 5A,18A

UNIVERSITY OF COLORADO, GRADUATE SCHOOL, PHYSICS + ASTROPHYSICS, COLORADO

ELEMENTARY PARTICLE INTERACTIONS

F. OPPENHEIMER, L. MARSHALL

NSF-GP-3396
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 891 2 FIELD 5A,20H, 7D,20J

UNIV OF WISCONSIN, GRADUATE SCHOOL, PHYSICS, WISCONSIN

ELEMENTARY PARTICLE AND NUCLEAR THEORY

A. M. BINCER, C. J. GOEBEL, K. W. MCVOY

NSF-GP-3637
2/65- 1/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1626 1 FIELD 20M,11F,20C, 5A

UNIV OF CAL-RIVERSIDE, GRADUATE SCHOOL, PHYSICS, CALIFORNIA

NUCLEAR RESONANCE IN METALS

R. R. HEWITT

NSF-GP-3532
10/64-10/65

NSF-PHYSICAL SCIENCES DIVISION

GSP 1738 1 FIELD 20M,20C, 5A,20L

UNIV OF TEXAS, AUSTIN, GRADUATE SCHOOL, PHYSICS, TEXAS

ELECTRONIC PROPERTIES OF METALS AT LOW TEMPERATURES BY ULTRASOUND

J. D. GAVENDA
NSF-GP-3377
9/65- 8/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1739 1 FIELD 5A,18A,20H, 7D

WAYNE STATE UNIVERSITY, GRADUATE SCHOOL, PHYSICS, MICHIGAN

QUANTUM THEORY OF FIELDS
S. N. GUPTA

NSF-GP-3186
7/65- 7/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1740 1 FIELD 20M,20J,20C, 5A

COLUMBIA UNIVERSITY, GRADUATE SCHOOL, PHYSICS, NEW YORK

ADIABATIC DEMAGNETIZATION IN THE ROTATING FRAME

S. R. HARTMANN

NSF-GP-3379
9/65- 8/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1741 1 FIELD 12A,20J,20C, 5A

MICHIGAN STATE UNIV, GRADUATE SCHOOL, PHYSICS + ASTRONOMY, MICHIGAN

HIGH RESOLUTION ABSORPTION SPECTRA AND MAGNETIC ROTATION SPECTRA IN THE NEAR INFRARED REGION

C. D. HAUSE, T. H. EDWARDS

NSF-GP-3160
7/65- 7/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1745 1 FIELD 20D, 5A,20L,20J

UNIV OF ROCHESTER, GRADUATE SCHOOL, PHYSICS + ASTRONOMY, NEW YORK

PHONON PHYSICS

E. H. JACOBSEN

NSF-GP-3367
9/65- 8/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1784 1 FIELD 20C, 5A,20L

RENSSELAER POLYTC INST, GRADUATE SCHOOL, PHYSICS, NEW YORK

SUPERCONDUCTIVITY AND LATTICE DEFECTS

R. W. SHAW

NSF-GP-3365
9/65- 8/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1829 1 FIELD 5A,18A, 7B

CITY UNIV N Y NEW YORK, UNDERGRADUATE SCHOOL, PHYSICS, NEW YORK

ANTIPROTON-PROTON INTERACTIONS

R. M. LEA, A. H. BACHMAN, P. BAUMEL

NSF-GP-3382
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1834 1 FIELD 20J,20C, 5A,20F

UNIV OF WASHINGTON, GRADUATE SCHOOL, PHYSICS, WASHINGTON

NUCLEAR MAGNETIC MOMENTS

M. H. MCDERMOTT

NSF-GP-3490
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1851 1 FIELD 5A,18A,20J

YALE UNIVERSITY, GRADUATE SCHOOL, PHYSICS, CONNECTICUT

QUANTUM FIELD THEORY AND THE INTERACTIONS OF ELEMENTARY PARTICLES

L. DURAND, L. S. BROWN, C. M. SOMMERFIELD

NSF-GP-3491
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1865 1 FIELD 20M,20D, 5A,20L

STANFORD UNIVERSITY, GRADUATE SCHOOL, PHYSICS, CALIFORNIA

MANY-PARTICLE SYSTEMS

W. A. LITTLE

NSF-GP-3368
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1881 1 FIELD 5A,18A

STEVENS INST OF TECH, GRADUATE SCHOOL, PHYSICS, NEW JERSEY

ELEMENTARY PARTICLES

S. TAYLOR, E. L. KOLLER

NSF-GP-3401
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1904 1 FIELD 4B,14B,20D

JOHNS HOPKINS UNIV, SCHOOL OF ENGINEERING, MECHANICS, MARYLAND

STREAKINESS IN ROTATING AND STRATIFIED FLUID SYSTEMS

G. S. BENTON

NSF-GP-1892
9/65- 9/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1982 1 FIELD 5A,18A

UNIVERSITY OF ARIZONA, GRADUATE SCHOOL, PHYSICS, ARIZONA

ELEMENTARY PARTICLES WITH COUNTERS AND TRACK CHAMBERS

T. BOWEN, E. W. JENKINS, R. M. KALBACH
E. MALAMUD

NSF-GP-3370
9/65- 8/66

NSF-PHYSICAL SCIENCES DIVISION

NGI 19 FIELD 8G,20L

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

EFFECT OF THE INTERMEDIATE PRINCIPAL STRESS ON THE STRENGTH OF ROCK

B. B. MAZANTI

/66- /

GEORGIA INSTITUTE OF TECHNOLOGY

NMT 7 FIELD 13G,20D

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MASSACHUSETTS

FREE SURFACE FLOW OVER THEWAVY BED

J. F. KENNEDY
/66- /

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NMT 9 FIELD 13G,20D

MASS INST OF TECHNOL, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, MASSACHUSETTS

MECHANICS OF STRATIFIED FLOW

D. R. HARLEMAN

/66- /

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NWS 7 FIELD 13B,12A,13M,20M

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

THE APPLICATION OF THE PRINCIPLES OF MAGNETO-HYDRODYNAMICS TO THE MEASUREMENT OF FLUID TURBULENCE

J. R. VILLEMONTE, R. GRATZ, J. ZOVNE

/66- /

WISCONSIN, UNIVERSITY OF

NWS 8 FIELD 13B,20D,20A, 7B

UNIV OF WISCONSIN, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, WISCONSIN

USE OF SOUND WAVES TO MEASURE PERMEABILITY IN POROUS MEDIA

P. L. MONKMEYER, H. C. MISRA

/66- /

WISCONSIN, UNIVERSITY OF

TES 799 FIELD 20L

RICE UNIVERSITY, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, TEXAS

A STUDY OF THE INTERACTION BETWEEN POINT DEFECTS AND MOVING DISLOCATIONS IN ANISOTROPIC METAL CRYSTALS

J. M. ROBERTS

4/64- 3/65

GUGGENHEIM FOUNDATION

UT 459 FIELD 20D, 5A,20L, 7B

BUCKNELL UNIVERSITY, UNDERGRADUATE SCHOOL, PHYSICS, PENNSYLVANIA

THE EFFECT OF AN INTERFACE LAYER OF INTERMEDIATE DENSITY ON THE KAPITZA RESISTANCE

O. T. ANDERSON

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 470 FIELD 5A, 7D

UNIVERSITY OF VIRGINIA, GRADUATE SCHOOL, PHYSICS, VIRGINIA

PHOTOEXCITATION AND ELECTROEXCITATION OF NUCLEI

J. M. EISENBERG

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 475 FIELD 5A,20L

STATE UNIV N Y BUFFALO, GRADUATE SCHOOL, PHYSICS, NEW YORK

AN INVESTIGATION OF THE MAGNETIC PROPERTIES OF AN ENCLOSED SUPERCONDUCTOR BY QUANTUM TUNNELING

R. I. GAYLEY

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 486 FIELD 7D, 7C, 7A,20M

HIRAM COLLEGE, UNDERGRADUATE SCHOOL, OHIO

ABSOLUTE MEASUREMENTS OF SMALL ANGLE X-RAY SCATTERING FROM SOLUTIONS AS A FUNCTION OF SOLUTION CONCENTRATION AND TEMPERATURE

L. B. SHAFFER

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

UT 495 FIELD 7D, 5A, 7B

DAVIDSON COLLEGE, UNDERGRADUATE SCHOOL, PHYSICS, NORTH CAROLINA

AN INVESTIGATION OF THE TRANSIENT CHANGES IN CONDUCTIVITY OF SILVER CHLORIDE, PRODUCED BY RAPID PLASTIC DEFORMATION

L. WHITE

1/65-12/65

RESEARCH CORP-WILLIAMS-WATERMAN FUND

YCA 378 3 FIELD 8H,20D

UNIV OF CAL-DAVIS, AGRICULTURAL EXPT STA, IRRIGATION, CALIFORNIA

ENERGY CONVERSION MECHANISMS IN INCOMPRESSIBLE FLUID FLOW

J. AMOROCHO

CAL-D-2079
/66- /

STATE-CALIFORNIA

YCO 85 3 FIELD 13G, 8H, 8G

COLORADO STATE UNIV, AGRICULTURAL EXPT STA, CIVIL ENGINEERING, COLORADO

HYDRAULICS LABORATORY

R. A. SCHLEUSENER

COLO-303-107
/66- /

STATE-COLORADO

YIL 227 FIELD 7D, 8D, 7B

STATE, GEOL SURV URBNA, ILLINOIS

CONTROLLED ATMOSPHERE ARC FOR OPTICAL EMISSION SPECTROGRAPH

J. A. SCHLEICHER, N. F. SHIMP
/65- /

STATE-ILLINOIS

## 21. Propulsion and Fuels

GYE 620098 FIELD 7C,21B,21D, 7D

HEBREW UNIVERSITY IS, ISRAEL

OXIDATION, COMBUSTION AND PYROLYSIS OF VARIOUS FUELS IN THE PRESENCE OF ADDITIVES

S. PATAI

AGF-A-10-FS-016
1/65-12/65

AGRICULTURE-DEPT OF AGRICULTURE

GYE 620098 1 FIELD 7C,21B,21D, 7D

HEBREW UNIVERSITY IS, ISRAEL

OXIDATION, COMBUSTION AND PYROLYSIS OF VARIOUS FUELS IN THE PRESENCE OF ADDITIVES

S. PATAI

AGF-A-10-FS-0016
1/66-12/66

AGRICULTURE-DEPT OF AGRICULTURE

WPC 5 FIELD 7C,21I, 7D,20J

POLYMER CORP SARNIA ON, CANADA

SYNTHESIS OF POLYMERS WITH REACTIVE END-GROUPS AS ROCKET FUEL BINDERS, ETC

J. E. MANION, J. BEATON, D. C. EDWARDS
R. C. MACKENZIE, R. WUNDER
7/65- 6/66

POLYMER CORPORATION LTD

YIL 225 FIELD 21B,21D, 7D,20M

STATE, GEOL SURV URBNA, ILLINOIS

IN SITU COMBUSTION CHARACTERISTICS OF ILLINOIS CRUDE OILS

R. F. MAST

/65- /

STATE-ILLINOIS

YIL 239 FIELD 21D, 7D, 7B

STATE, GEOL SURV URBNA, ILLINOIS

SULFUR IN COAL AND ITS RETENTION IN COAL ASH

O. W. REES, C. W. BEELER, N. F. SHIMP
/65- /

STATE-ILLINOIS

YIL 240 FIELD 7D,21D, 8G

STATE, GEOL SURV URBNA, ILLINOIS

CHEMISTRY AND LIMITATIONS OF COAL ANALYSIS

O. W. REES
/65- /

STATE-ILLINOIS

# TECHNICAL ABSTRACT BULLETIN

## 1/1. AERODYNAMICS

**AD-624 860 Fld. 1/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*CORNELL AERONAUTICAL LAB INC BUFFALO N Y*
**AIR LOADINGS ON A ROTOR BLADE AS CAUSED BY TRANSIENT INPUTS OF COLLECTIVE PITCH.**
Final rept. Sep 63-May 65,
by Leonard Segel. Oct 65, 86p. Rept. no. cal-BB-1840-S-1
Contract DA-44-177-AMC-77 (T) Proj. DA-1P125901A142 USAAVLABS TR-65-65
Unclassified report

Descriptors: (*Rotor blades (Rotary wings), Aerodynamic loading), (*Aerodynamic loading, Pitch (Motion)), Rotary wings, Helicopters, Vertical take-off planes, Digital computers, Helicopter rotors, Mathematical prediction, Wake

A method is developed for predicting the nonperiodic air loads caused by control inputs applied to a rotary wing in forward flight. Use is made of a numerical description of the geometry and circulation strength of the vorticity in the wake to compute the time-varying, nonuniform-flow field in the plane of the rotor disc. The method of approach is similar to that developed previously for the steadystate flight condition, the major difference being that the solution procedure lends itself to the treatment of transient phenomena, such as the nonperiodic loadings caused by time-varying collective pitch. Several approximations are made to simplify the analysis. The major assumptions are: (1) the rotor blades are structurally rigid and have only a flapping degree of freedom; (2) the hub of the rotor continues to translate in level, constant-speed flight during the short time interval of interest; (3) the geometry of the wake can be specified a priori; and (4) no account need be taken of the shed vorticity in the wake. Computed flapping and air load distributions are compared with transient data obtained in wind-tunnel tests on a full-scale H-34 rotor. In general, agreement is found leading to the conclusion that calculation and prediction of nonperiodic loadings on rotary wings is a feasible task. (Author)

## 1/2. AERONAUTICS

**AD-625 284 Fld. 1/2, 5/9**
**CFSTI Prices: HC $7.00 MF $1.75**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**AVIATION HANDBOOK (FOR THE PILOT AND NAVIGATOR),**
by V. M. Lavskii. 17 Nov 65, 379p. Rept. no. ftd-MT-64-273
TT 66-60062
Unclassified report

Edited machine trans. of mono. Aviatsionnyi Spravochnik (Dlya Letchika i Shturmana) Moscow, 1964 415p.

Descriptors: (*Aeronautics, Handbooks), Pilots, Navigators, Meteorology, Aerodynamic characteristics, Aircraft, Aircraft engines, Navigation, Aviation charts, Celestial navigation, Mapping, Bombing, Aerial photography, Aerial gunnery, Radio communication systems, Physics, Mathematics, Computers

The handbook is intended for pilots and navigators of the Air Force of the Soviet Army. In the book is given information material on basic questions of aerodynamics, design of aircraft and their engines, air navigation, bombing, air firing, aerial photography, aircraft maneuvering, and also aviation cartography and geodesy, aviation astronomy and meteorology. Furthermore, in the handbook there are certain materials on physics, radio engineering, mathematics, and computers in a volume necessary for flying personnel of the Air Force in their practical activity.

**AD-625 368 Fld. 1/2, 1/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*DAVIDSON LAB STEVENS INST OF TECH HOBOKEN N J*
**THE EFFECT OF WAVES, LOADING, AND CONFIGURATION ON THE TAKE-OFF PERFORMANCE OF WATERBASED AIRCRAFT,**
by Robert Van Dyck. Nov 64, 40p. Rept. no. sit (dl)1031
Contract NOw-62-0728-d Proj. DL-2613/340
Unclassified report

Descriptors: (*Water-based planes, Take-off), (*Takeoff, Water-based planes), (*Seaplanes, Take-off), Flying boat hulls, Hydro-skis, Hydrodynamic configurations, Model tests, Water waves, Loading (Mechanics), Performance (Engineering)

A model investigation was undertken to define the effects of waves, loading, and hydrodynamic configuration on the over-all take-off performance of waterbased aircraft. Complete take-offs were made using dynamic models towed at constant thrust in calm water and in regular waves. Performance is evaluated by means of the average resistance-to-gross-weight ratio obtained from the time-distance-velocity measurements made during take-off. At a given loading, average resistance increases in proportion to wave height for take-offs made in wavelenghts on the order of twice the hull length. Curves are presented showing the effects of loading, and comparisons are made between the different configurations tested. The model data show trends generally similar to those of available full-scale take-off results, when take-off time and distance are properly defined. (Author)

**AD-625 599 Fld. 1/2, 1/3**
**CFSTI Prices: HC $5.00 MF $1.00**
*SYSTEMS TECHNOLOGY INC HAWTHORNE CALIF*
**AN ANALYTICAL STUDY OF V/STOL HANDLING QUALITIES IN HOVER AND TRANSITION.**
Technical rept.,
by R. L. Stapleford, J. Wolkovitch, R. E. Magdaleno, C. P. Shortwell, and W. A. Johnson. Oct 65, 172p. Rept. no. tr-140-1
Contract AF33 (615)-1300 Proj. AF-8219 Task 821909
AFFDL TR-65-73
Unclassified report

Descriptors: (*Convertible planes, Handling), (*Short take-off planes, Handling), (*Vertical take-off planes, Handling), Gusts, Hovering, Pilots, Control, Damping, Helicopters, Tilt wings, Geometric forms

The hover analysis considers pilot attitude and position control tasks in the presence of horizontal gusts. The effects of each of the stability derivatives on the difficulty of the control tasks and on the closed-loop gust responses are determined. It is clearly shown that the handling qualities studies of control sensitivity and angular damping must consider the influences of M sub u (or L sub v) and should include gust inputs. These conclusions are substantiated by previous variable-stability-helicopter experiments. The effects of vehicle size and geometry are investigated by several approaches. The key result of increasing size is found to be a reduction in M sub u and L sub v which can, in turn, lower the requirements for control power and damping. The handling qualities during transition of two vehicles, a tilt duct and a tilt wing, which were previously tested on a simulator are analyzed. It is shown that both trim control and perturbations about the trim conditions must be considered. In fact, part of the increased difficulty in landing transitions, in compariton with takeoff transitions, is due to more difficult trim control; the much more stringent position control requirements in landing are also a contributing factor. (Author)

**AD-625 353** **See Fld. 15/5**

## 1/3. AIRCRAFT

**AD-624 930 Fld. 1/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*LTV VOUGHT AERONAUTICS DIV LING-TEMCO-VOUGHT INC DALLAS TEX*
**METHOD FOR ESTIMATING THE CATAPULT PERFORMANCE OF A CARRIER-BASED AIRPLANE.**
Final rept.,
by William W. Kitts, and Curtis R. Lucas. 17 May 63, 45p. Rept. no. 2-53470/3R459
Contract NOw-62-0197-t Task 62-1
Unclassified report

Descriptors: (*Airplanes, Catapults), (*Mathematical models, Performance (Engineering)), Equations of motion, Iterative methods

The method consists of two parts; (a) the determination of airplane position at the end of the catapult power stroke and (b) the determination of the motion of the airplane subsequent to leaving the catapult. The method is oriented toward use of a small digital computer; however, the calculations could be performed with only the use of a desk calculator. (Author)

**AD-625 332 Fld. 1/3, 20/1, 5/10, 13/13**
**CFSTI Prices: HC $7.00 MF $1.50**
*NATIONAL OPINION RESEARCH CENTER NEW YORK*
**COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA. VOLUME II. DATA ON COMMUNITY REACTIONS AND INTERPRETATIONS.**
Final rept., Apr 63-Feb 65,
by Paul N. Borsky. Oct 65, 315p. Rept. no. 101-Pt-2
Contract AF33 (657)-11148 Proj. 7231 Task 723103
AMRL TR-65-37-Vol-2
Unclassified report

Descriptors: (*Sonic boom, Public opinion), Attitudes, Population, Urban areas, Damage, Structures, Reaction (Psychology), Noise, Supersonic planes, Commercial planes, Oklahoma, Tables

During a period of six months from February to July 1964, the Oklahoma City, Oklahoma, area was repeatedly exposed to sonic booms generated to simulate overpressure levels that are expected for supersonic transport overflights. The schedule provided for eight sonic booms per day. During the six-month period, almost 3,000 local residents were interviewed three times to determine the nature and extent of their reactions to the sonic booms. This report contains a detailed description of the overall study design including the selection of households, selection of respondents, training and selection of interviewers and samples of questionnaires used during the interviews. Among the findings it was determined that ordinary living activities were often interrupted by sonic booms, but that a majority of the residents felt they could learn to live with the interruptions. A substantial number of residents felt they had sustained damages

from the booms, although detailed engineering observations of structures in the area did not confirm most of these reports. As the intensity of the booms increased, acceptance of the booms by residents was reduced. Residents who felt that the development of a commercial supersonic airplane was important were more likely to accept the exposures to the sonic booms. (Author)

**AD-625 368** **See Fld. 1/2**

**AD-625 407** **See Fld. 21/4**

**AD-625 454** **See Fld. 11/6**

**AD-625 599** **See Fld. 1/2**

## 2/4. AGRONOMY AND HORTICULTURE

**AD-625 641** **See Fld. 6/3**

## 3/2. ASTROPHYSICS

**AD-624 882 Fld. 3/2, 20/6**
*YALE UNIV NEW HAVEN CONN*
**A DUAL-CHANNEL PULSE-COUNTING ASTRONOMICAL SPECTROPHOTOMETER,**
by James P. Rodman. 24 Sep 62, 11p.
Unclassified report

*Availability: Published in Applied Optics, v2 n2 p165-75 Feb 1963. Copies to DDC users only.*

Descriptors: (*Spectrophotometers, Astronomical observatories), (*Astrophysics, Spectrophotometers), Stars, Optical analysis, Optical instruments, Pulse counters, Digital systems, Specifications, Optics

A spectrophotometer constructed and used by the author simultaneously compares 15 A centered at H alpha with 100 A of flanking continuum, also 15 A centered at Ca K with 100 A of flanking continuum; the readout employs pulse-counting electronics and an automatic digital printer. Wavelengths other than H alpha and CaK may be easily selected. Design criteria and relevant details of construction are discussed. A special cooling pump used to refrigerate the photomultiplier tubes is described, together with a system for preventing condensation of moisture on the optics and photomultiplier. The performance of the apparatus is discussed--in particular its approach to 1% accuracy in individual H alpha line-intensity readings, and its ability to work through several magnitudes of varying clouds and extinction with essentially unimpaired accuracy. (Author)

**AD-624 883 Fld. 3/2, 20**
*YALE UNIV NEW HAVEN CONN OBSERVATORY*
**ON JOVIAN H-ALPHA AURORAL ACTIVITY,**
by Harlan J. Smith, James P. Rodman, and William A. Sloan. 1963, 1p.
Unclassified report

*Availability: Published in the Astronomical Journal, v68 n2 Mar-No. 1307 1963. Copies to DDC users only.*

Descriptors: (*Jupiter (Planet), Optical phenomena), Astrophysics, Hydrogen, Aurorae, Planetary atmospheres, Spectroscopy, Radio astronomy

**AD-624 895 Fld. 3/2, 20/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*YALE UNIV NEW HAVEN CONN*
**SEARCH FOR PLANETARY OPTICAL EMISSION, AND STUDY OF FLARE ACTIVITY OF NEARBY STARS.**
Final rept.,
by Harlan J. Smith. 3 Dec 65, 5p. Contract Nonr (G)-00043-62 Proj. NR-046-778
Unclassified report

Descriptors: (*Jupiter (Planet), Optical phenomena), (*Stars, Optical phenomena), Astrophysics, Planetary atmospheres, Aurorae, Radio astronomy, Spectroscopy, Instrumentation

**AD-624 914 Fld. 3/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**STRUCTURAL, CORRELATION, AND SPECTRAL FUNCTIONS OF INTERSTELLAR GAS TURBULENCE,**
by S. A. Kaplan. 19 Nov 65, 17p. Rept. no. ftd-MT-65-09
TT 65-64821
Unclassified report

Edited machine trans. of Astronomicheskii Zhurnal (USSR) v32 n3 p255-64 1955.

Descriptors: (*Insterstellar matter, Turbulence), Astrophysics, Celestial mechanics, USSR

Structural, correlation, and spectral functions of interstellar medium turbulence are calculated on the basis of Adams' catalog of radial velocities of interstellar gas clouds. Results of these calculations show that motion of interstellar medium is described fully satisfactorily by the theory of isotropic and homogeneous turbulence. Structural, correlation, and spectral functions are shown. Discussion is given of the possibility of describing turbulence of the interstellar medium with the help of the contemporary theory of turbulence. (Author)

**AD-624 958 Fld. 3/2**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING*
**2,700 MC./S. SOLAR PATROL AT THE DOMINION RADIO ASTROPHYSICAL OBSERVATORY, PENTICTON( B.C.**
by A. E. Covington, and J. L. Locke. 1965, 7p.
NRC 8518
Unclassified report

*Availability: Published in The Journal of the Royal Astronomical Society of Canada, v59 n3|4 p101-6 1965. Copies to DDC users only.*

Descriptors: (*Radio astronomy, Solar radiation), (*Sun, Radio astronomy), Ultrahigh frequency, Extraterrestrial radio waves, Radio telescopes, Radiometers, Astronomical observatories, British Columbia, Astrophysics

**AD-625 026 Fld. 3/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*MICHIGAN UNIV ANN ARBOR DEPT OF ASTRONOMY*
**BASIC SOLAR RESEARCH.**
Annual rept., 1 Oct 64-1 Oct 65,
by O. C. Mohler. 1 Oct 65, 7p. Contract Nonr-1224 (19) Proj. VELA ,NR-013-205
Unclassified report

Descriptors: (*Sun, Scientific research), Solar flares, Solar spectrum, Solar disturbances, Sunspots, Terrestrial magnetism, Magnetohydrodynamics

A brief summary is given of work in progress on: Halpha flare importance; Solar activity; Photospheric magnetic field in an actively flaring region; Related flares; Level of solar activity during IQSY; Forecasts of solar activity; Hydromagnetic theory and the sun; Wavelength of solar spectrum lines; Magnetic classification of sunspots.

**AD-625 032 Fld. 3/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARIZONA UNIV TUCSON LUNAR AND PLANETARY LAB*
**INVESTIGATION OF O AND B SPECTRA OF STARS.**
Progress rept. for period ending 1 Nov 65,
by B. M. Middlehurst. 1 Nov 65, 8p. Contract Nonr (G)-00029-64 Proj. NR-046-803
Unclassified report

Descriptors: (*Stars, Spectroscopy), Astrophysics, Spectrum signatures, Line spectrum, Hydrogen, Helium, Astronomical observatories

**AD-625 108 Fld. 3/2**
*ALBERTA UNIV CALGARY DEPT OF PHYSICS*
**COSMIC NOISE AND MAGNETIC MEASUREMENTS AT CALGARY DURING THE SOLAR ECLIPSE OF JULY 20, 1963.**
by H. A. Buckmaster. 9 Apr 65, 4p. Contract DRB-2801-16
Unclassified report

*Availability: Published in Canadian Journal of Physics v43 p1394-6 Jul 1965. Copies to DDC users only.*

Descriptors: (*Radio astronomy, Solar eclipses), (*Solar eclipses, Radio astronomy), Extraterrestrial radio waves, Terrestrial magnetism, Recording systems, Canada

**AD-625 131 Fld. 3/2, 20/6, 4/1**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB*
**SOLAR XUV SPECTRUM OF MARCH, 1964.**
Environmental research papers,
by L. A. Hall, W. Schweizer, L. Heroux, and H. E. Hinteregger. 22 Jan 65, 12p. Rept. no. erp-146
Proj. AF-6688 Task 668806
AFCRL 65-745
Unclassified report

*Availability: Published in The Astrophysical Journal v142 n1 p13-15 Jul 1 1965. Copies to DDC users only.*

Descriptors: (*Solar spectrum, Ultraviolet radiation), (*Ultraviolet spectroscopy, Solar spectrum), Solar radiation, Optical scanning, Airborne, Rockets, Telemeter systems, Optical instruments

This note describes results from a rocket experiment of March 30, 1964, which covered the solar spectrum from 312 to 55 A for the third time with a telemetering grating monochromator of the type used in various AFCRL measurements in the past. The main features of the observations of May 2, 1963, reported previously are confirmed except for an apparently real decrease of the Fe XV (284-A) line intensity. (Author)

**AD-625 134 Fld. 3/2, 20/6**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB*
**ROCKET SPECTRA OF THE CHROMOSPHERE.**
Environmental research papers,
by Hans. E. Hinteregger. 1965, 38p. Rept. no. ERP-142
Proj. AF-6688 Task 668803
AFCRL 65-708
Unclassified report

*Availability: Published in the Solar Spectrum, Dordrecht, ed. by C. de Jager p179-205. Copies to DDC users only.*

Descriptors: (*Chromosphere, Ultraviolet spectroscopy), (*Solar spectrum, Ultraviolet radiation), (*Ultraviolet spectroscopy, Chromosphere), Airborne, Rockets, Satellites (Artificial), Instrumentation, Astrophysics

A review of solar spectra at wavelengths accessible only to rockets and satellite instrumentation is presented by means of a survey of the different types of measurements and typical results obtained in the period 1958-1963. A brief summary of the relevant technology is included and an extensive bibliography. (Author)

**AD-625 178 Fld. 3/2, 20/9, 8/14**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA UNIV BERKELEY SPACE SCIENCES LAB*
**SOLAR SYSTEM MAGNETIC FIELDS AND PLASMAS.**
Technical rept.,
by John M. Wilcox. 24 Nov 65, 36p. Rept. no. ssl (uc)-6-50

Contract Nonr-3656 (26) Grant ,NsG-243-62
Unclassified report

Invited paper delivered at the Symposium on the Dynamics of Fluids and Plasmas, Univ. of Maryland, Oct 7-9, 1965. To be published in the Proceedings of the Symposium on the Dynamics of Fluids and Plasmas.

Descriptors: (*Solar systems, Plasma physics), (*Plasma physics, Solar systems), (*Magnetic fields, Solar systems), Sunspots, Terrestrial Magnetism, Astrophysics, Geophysics

The report begins with the magnetic fields observed on the surface of the sun, moves out to interplanetary fields and plasmas and their relation to these solar magnetic fields, and finally come to earth in a plasma physics laboratory. Against this background the report presents some recent results obtained in collaboration with N. F. Ness with the magnetometer experiment on the IMP-1 satellite as supplemented with observations obtained in collaboration with R. Howard with the Mount Wilson Observatory solar magnetograph. (Author)

**AD-625 366 Fld. 3/2**
*STANFORD UNIV CALIF RADIO ASTRONOMY INST*
**HIGH-RESOLUTION OBSERVATIONS OF THE RADIO SUN AT 9.1 CENTIMETERS ON JULY 20, 1963,**
by H. K. Asper, R. N. Bracewell, J. Deuter, T. Krishnan, and J. Picken. 17 Jan 64, 3p. Rept. no. reprint-R-31
Contract AF18 (603)-53 ,AF49 (638)-1059 AFOSR 65-2255
Unclassified report

Prepared in cooperation with Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.

*Availability: Published in Journal of Geophysical Research v69 n9 p1805-7 1 May 1964. Copies to DDC users only.*

Descriptors: (*Radio astronomy, Sun), Solar eclipses, Resolution, Astrophysics, Solar spectrum

The 9.1-cm radio sun at the time of the eclipse of July 20, 1963, had two radio plages. One, of moderate importance, was located near the east limb at 58 deg = 2 deg E and 10 deg = 2 deg N. It had a flux density of about 5 X 10 to the minus 22nd watt/sq m/ (c/s) and an angular size in the east-west direction of 1.5 min. The brightness temperature was 1,000,000 K (effective value for a uniform circular source 1.5 min in diameter). The other was of much lower intensity and was located near the west limb at 80 deg = 10 deg W and 4 deg = 2 deg N. Its flux density was about 2 X 10 to the minus 22nd watt/sq m/ (c/s), and its size less than 3.5 min in both north-south and east-west directions. (Author)

**AD-625 381 Fld. 3/2**
**CFSTI Prices: HC $4.00 MF $0.75**
*HARVARD COLL OBSERVATORY CAMBRIDGE MASS SOLAR DEPT*
**CLASSIFICATION OF SOLAR PROMINENCES FOR SUNSPOT CYCLE NO. 19 - 1962,**
by D. H. Menzel, and F. S. Jones. Oct 65, 119p. Rept. no. scientific-5
Contract AF19 (628)-3322 Proj. AF-7649 Task 764906
AFCRL 65-841
Unclassified report

Descriptors: (*Solar disturbances, Astronomical data), (*Sunspots, Astronomical data), Astronomical observatories, New Mexico

This report contains a tabulation and analysis of the behavior classification of prominences observed during 1962 at the Sacramento Peak Observatory, Sunspot, New Mexico.

**AD-625 400 Fld. 3/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*TEXAS UNIV AUSTIN DEPT OF ASTRONOMY*
**SPECTROSCOPIC AND RADIAL VELOCITY SURVEY OF BRIGHT GALAXIES.**
Final rept., 1 Mar 61-30 Nov 65,
by Gerard de Vaucouleurs, and Antoinette de Vaucouleurs. 15 Dec 65, 7p. Contract Nonr-375 (13) Proj. NR-046 785
Unclassified report

Descriptors: (*Galaxies, Spectroscopy), Celestial mechanics, Velocity, Phase shift, Infrared radiation, Astrophysics

**AD-625 493 Fld. 3/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*YERKES OBSERVATORY WILLIAMS BAY WIS*
**SPECTRAL CLASSIFICATION AND SPECTROSCOPIC STUDIES.**
Final rept.,
by W. A. Hiltner. 17 Dec 65, 3p. Contract Nonr (G)-0008-65
Unclassified report

Descriptors: (*Stars, Classification), (*Spectroscopy, Stars), Astrophysics

A brief summary is given of current research on spectrograms obtained for classification purposes of stars listed in Luyten's Catalog.

**AD-625 535 Fld. 3/2**
*CALIFORNIA UNIV BERKELEY DEPT OF ASTRONOMY*
**THERMODYNAMICS OF A SOLAR COMPOSITION GASEOUS MIXTURE,**
by M. S. Vardya. 8 May 64, 9p. Rept. no. 295
Contract AF-AFOSR-171-63 AFOSR 65-2199
Unclassified report

*Availability: Published in Monthly Notices of the Royal Astronomical Society v129 n2 p205-13 1965. Copies to DDC users only.*

Descriptors: (*Thermodynamics, Solar atmosphere), (*Solar atmosphere, Thermodynamics), Hydrogen, Ions, Helium, Equations of state, Numerical method and procedures

Computation of several thermodynamic quantities has been carried out for a gaseous mixture of solar photospheric chemical composition containing hydrogen in five states--H2+, H2, H, H-, and H+--helium and sixteen other elements in multiple ionization states and with radiation effects included. The discrepancy on various thermodynamic quantities of the neglect of H2+ and H-, of metals and of radiation pressure has been estimated. (Author)

**AD-625 538 Fld. 3/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*COLORADO UNIV BOULDER*
**DEVELOPING A SYSTEM OF SOLAR FLARE PREDICTION.**
Semi-annual rept. no. 3, 1 Jul-31 Dec 65,
by Donald E. Billings. 31 Dec 65, 4p. Contract Nonr-1147 (13) ,ARPA Order-215 Proj. NR-013-215
Unclassified report

Descriptors: (*Solar flares, Mathematical prediction), Sunspots, Optical properties, X rays, Correlation techniques

Studies are made of flare light curves compared to x-ray data, and for very early evidence of a preferred longitude for solar activity. Attention is also given to basic principles of flare radiation and sunspot growth.

**AD-625 036** **See Fld. 4/1**

**AD-625 124** **See Fld. 20/6**

**AD-625 132** **See Fld. 14/2**

**AD-625 260** **See Fld. 4/1**

**AD-625 337** **See Fld. 20/6**

**AD-625 393** **See Fld. 8/7**

## 3/3. CELESTIAL MECHANICS

**AD-625 373 Fld. 3/3, 22/3**
**CFSTI Prices: HC $4.00 MF $1.00**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**SOME PERIODIC TRAJECTORIES IN CISLUNAR SPACE VERY RESTRICTED FOUR BODY APPROXIMATION.**
Master's thesis,
by Raymond Earl Siferd. Aug 65, 129p. Rept. no. ga/mech/65-40
Unclassified report

Descriptors: (*Orbital trajectories, Celestial mechanics), (*N-body problem, Orbital trajectories), Perturbation theory, Gravity, Sun, Moon, Earth, Lunar trajectories, Equations of motion, Integration

The possibility of existence of periodic or nearly periodic trajectories in cislunar space is investigated. In cislunar space, the motion is determined by the gravitational fields of the earth, moon, and sun. The problem is studied using the very restricted four body approximation. It is assumed that the earth and moon revolve in circular paths about their barycenter and the barycenter of the earth and moon moves in a circle about the sun. The motion of the infinitesimal fourth body is restricted to the plane of the three finite bodies. The equations of motion are integrated numerically using a digital computer. A class of periodic or nearly periodic trajectories is found in cislunar space. The period of each trajectory is approximately 29.53 days with respect to a coordinate system centered at the earth-moon barycenter and rotating at the rate the moon rotates about the earth. Periodic trajectories are found which circle the earth, the moon, and the earth-moon L libration point. (Author)

## 4/1. ATMOSPHERIC PHYSICS

**AD-624 903 Fld. 4/1, 20/9, 20/14**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEFENCE RESEARCH BOARD OTTAWA (ONTARIO)*
**ABSTRACTS OF PAPERS FOR WHICH THE RESEARCH WAS SUPPORTED IN PART BY GRANT 2801-21.**
Rept. for 1 Apr-31 Oct 65,
by Neil M. Brice. 31 Oct 65, 16p.
Unclassified report

Descriptors: (*Ionospheric propagation, Scientific research), (*Plasma physics, Scientific research), Cyclotron resonance phenomena, Whistlers, Protrons, Resonance absorption

Contents: Study of ionospheric constituents by multiple ion propagation phenomena; Ion effects observed in radio wave propagation in the ionosphere; Effects which limit the duration of ion cyclotron whistlers; Proton temperature deduced from measurements of the bandwidth of proton cyclotron resonance absorption; and Some theoretical aspects of ion resonances.

**AD-625 011 Fld. 4/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**PHOTOCHEMICAL DESTABILIZATION OF GRAVITY WAVES NEAR THE MESOPAUSE,**

by C. B. Leovy. Nov 65, 45p. Rept. no. rm-4818-PR
Contract AF49 (638)-700

Unclassified report

Descriptors: (*Upper atmosphere, Stability), (*Photochemistry, Upper atmosphere), Gravity, Oscillation, Ozone, Solar radiation, Wind, Frequency

A number of possible interaction mechanisms between internal gravity waves and radiative and photochemical processes at altitudes from 80 to 120 km are considered. The heat of recombination of atomic oxygen and absorption of solar radiation by ozone are both found to contribute to wave amplification. Growth rates are slow under normal conditions but can become significant if the atomic oxygen concentration below 100 km is increased above its normal values. This could be brought about by large-scale descending motion or by increased mixing near the mesopause. (Author)

**AD-625 036 Fld. 4/1, 3/2, 8/14**
**CFSTI Prices: HC $4.00 MF $0.75**
*COMISION NACIONAL DE INVESTIGACIONES ESPACIALES BUENOS AIRES (ARGENTINA)*
**INTERNATIONAL YEARS OF THE QUIET SUN VOLUME I (ANOS INTERNACIONALES DEL SOL CALMO).**
Special pub.
1965, 115p. Rept. no. cnie-PE-2
Contract AF-AFOSR-716-65 AFOSR 65-1730

Unclassified report

Proceedings of the Regional Symposium held at Buenos Aires, Aug 64.

Descriptors: (*Astrophysics, Symposia), (*Geophysics, Symposia), Terrestrial magnetism, Atmospheric sounding, High altitude, Nuclear explosions, Solar disturbances, Cosmic rays, Space environmental conditions, Atmospheric motion, Reviews, Argentina

During the first week of August 1964, the Regional Symposium of the International Years of the Quiet Sun was held at Buenos Aires and attended by several Argentine and foreign scientists. This Publication includes the following invited papers: Recent Techniques in Geomagnetic Measurements; Variations of Solar Origin in the Earth's Upper Atmosphere; Geophysical Effects of High Altitude Nuclear Explosions; Acceleration Processes in the Sun for High Energy Particles; Fireballs, Isobars and Extensive Air Showers; Problems of Stratospheric Circulation for Study in the IQSY.

**AD-625 066 Fld. 4/1, 20/4, 20/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ON ONE MATHEMATICAL PROBLEM OF THE THEORY OF HEAT TRANSFER.**
by Ya. S. Rabinovich. 8 Dec 65, 10p. Rept. no. FTD-TT-65-1137
TT 65-64850

Unclassified report

Unedited rough draft trans. of InzhenernoFizicheskii Zhurnal (USSR) v7 n11 p67-72 1964.

Descriptors: (*Heat transfer, Atmospheric motion), (*Mass transfer, Atmospheric motion), Boundary value problems, Turbulence, Boundary layer, Wind, USSR

Heat and mass transfer in the stratified turbulent atmosphere are discussed. The diffusion equation is solved for a two-layer model. The coefficient of turbulent exchange and wind profile are assumed to be power functions of height (3) in the lower layer of the atmosphere and exponents (4) in the upper layer, the solutions (13) being conjugated on the boundary between these two layers. (Author)

**AD-625 137 Fld. 4/1, 4/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF METEOROLOGY*
**OBJECTIVE CROSS-SECTION ANALYSIS.**
Final rept., pt. 2, 22 Mar 60-31 Dec 63,
by R. T. Duquet, E. F. Danielsen, and N. R. Phares. Dec 64, 39p. Contract AF19 (604)-7261 AFCRL 64-1005-P2

Unclassified report

Descriptors: (*Atmospheric sounding, Numerical analysis), (*Meteorological parameters, Numerical analysis), Radiosondes, Wind, Atmospheric temperature, Distribution, Meteorological charts

The distribution of wind and of temperature in a vertical cross section through the atmosphere is derived from radiosonde and rawinsonde data by an objective analysis procedure suitable for automatic computers. The method of interpolation takes advantage of the fact that soundings in the plane of the cross section provide data along vertical lines rather than at randomly distributed points. The thermal wind equation is used to modify the interpolated distribution through a partial differential equation derived from the calculus of variations. Results indicate that the technique is capable of delineating not only the gross vertical structure of the atmosphere but also some significant layers of high stability and/or potential vorticity which are inadequately defined by analyses in quasi-horizontal planes at the standard pressure levels. (Author)

**AD-625 233 Fld. 4/1, 20/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**NUMERICAL ESTIMATES OF LUMINANCE AND TOTAL BRIGHTNESS OF THE TERRESTRIAL HALO,**
by R. C. Moore, and G. F. Schilling. Nov 65, 49p. Rept. no. rm-4747-PR
Contract AF49 (638)-700

Unclassified report

Descriptors: (*Sky brightness, Numerical analysis), (*Atmosphere, Optical properties), (*Luminescence, Atmosphere), Earth, Light, Solar radiation, Reflection, Optics, Geometry

An application of a semiempirical method to obtain quantitative values of the brightness of the earth's halo as it would appear to an observer in space experiencing a central total solar eclipse with the earth as the eclipsing body. Results are presented for a range of radial altitudes from 10,000 to 255,000 km. Both the luminance or surface brightness of the atmospheric halo and the total brightness or illumination received by an observer within this altitude range are given. Extensive appendixes fully discuss the mathematical treatment, including the implicit assumptions and estimates of the probable accuracy. (Author)

**AD-625 250 Fld. 4/1, 8/14**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**AURORAS AND IRON DEPOSITS,**
by O. Morskov, and V. Lyustiberg. 15 Dec 65, 5p. Rept. no. ftd-TT-65-1295
TT 66-60056

Unclassified report

Unedited rough draft trans. from Kazakhatanskaya Pravda (USSR) 12 Jan p4 1965.

Descriptors: (*Aurorae, Terrestrial magnetism), (*Iron, Terrestrial magnetism), Ores (Metal Sources), Ferromagnetic materials, Ferromagnetism, Cosmic rays, Focusing, Geophysics, USSR

**AD-625 260 Fld. 4/1, 3/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**ON THE SCATTERING OF SUNLIGHT INTO PLANETARY SHADOW CONES,**
by R. C. Moore, and G. F. Schilling. Dec 65, 27p. Rept. no. p-3282

Unclassified report

Prepared for presentation at the Symposium on Interdisciplinary Aspects of Radiative Energy Transfer, Philadelphia, Pa., Feb 24, 26, 1966.

Descriptors: (*Solar radiation, Atmospheric refraction), (*Planetary atmospheres, Optical phenomena), (*Atmospheric refraction, Solar radiation), Light, Reflection, Refraction, Lunar eclipses, Solar eclipses, Geophysics, Astrophysics

Refraction and multiple scattering of solar radiation in a planetary atmosphere cause the propagation of appreciable amounts of radiative energy into the planet's geometric shadow cone. The implications of this atmospheric phenomenon to research in various fields are discussed. Examples are studies of lunar eclipses, the presence of the Venus ring near inferior conjunction, the astronomical problem of the appearance of the earth as a planet, and the flights of spacecraft in earth orbit and in cislunar space. It is shown that the results of such studies can provide data in disciplines involving geophysics, planetary atmospheres, solar physics, astronomy, and astronautics. Rigorous solutions of radiative transfer problems in a real atmosphere, however, still are beyond the capabilities of present theory. Some preliminary quantitative results in the visible range of the electromagnetic spectrum have been obtained through the use of a semiempirical method. This technique promises to become a useful tool in the fields of study discussed. (Author)

**AD-625 309 Fld. 4/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**CORRELATION BETWEEN CLEAR-AIR TURBULENCE AND AIRCRAFT ELECTRICAL ACTIVITY.**
Final rept., Oct 63-Aug 65,
by Joseph E. Nanevicz, Edward F. Vance, and Sidney M. Serebreny. Oct 65, 76p. Contract AF19 (628)-3308 Proj. 6020 ,SRI-4690 Task 602003
AFCRL 65-614

Unclassified report

Descriptors: (*Clear air turbulence, Electrical properties), (*Aircraft, Static electricity), (*Static electricity, Aircraft), Static dischargers, Electric discharges, Electrical corona, Meteorological parameters, Flight paths, Correlation techniques

The results of a cooperative effort by Stanford Research Institute, United Air Lines, and Air Force Cambridge Research Laboratories to determine the correlation between regions of clear-air turbulence (CAT) and aircraft electrical activity are described. Corona discharges from precipitation static dischargers on DC-8 aircraft were monitored and correlated with CAT encounters. A significant correlation was found to exist between CAT encounters and periods of electrical discharge. It is suggested that these electrical discharges may be caused by electric fields in the region of clear-air turbulence, particulate matter in the region that charges the aircraft, or a combination of both. A meteorological analysis was made of the regions where turbulence associated with electrical activity was observed. This analysis indicated that the CAT incidents were associated with jet streams. (Author)

**AD-625 349 Fld. 4/1, 20/14**
**CFSTI Prices: HC $2.00 MF $0.50**
*DENVER UNIV COLO DEPT OF PHYSICS*
**BALLOON BORNE INFRARED STUDIES.**
Final scientific rept. 1 Sep 60-31 Aug 65,

by David G. Murcray, Frank H. Murcray, and Walter J. Williams. 30 Sep 65, 30p. Contract AF19(604)-7429 Proj. AF-8662 Task 866201 AFCRL 65-755

Unclassified report

Descriptors: (*Infrared spectrum, Atmosphere), (*Solar spectrum, Infrared radiation), (*Atmosphere, Infrared radiation), Absorption, Infrared radiation, Earth, Balloons, Instrumentation, Wave transmission

The primary objective of this program was to obtain experimental data concerning the infrared spectral transmittance of the earth's atmosphere at high altitudes. Data pertinent to this objective were obtained by studying the variation of the infrared solar spectrum with altitude. Instrumentation capable of measuring selected portions of the infrared solar spectrum while it is carried aloft by balloons was constructed and flown a number of times as part of this program. A description of the instrumentation used to obtain these data and a summary of the flights made during the program are given. A secondary objective was to measure the variations with altitude of the infrared radiation emitted by the earth and its atmosphere. These measurements were also made with balloon borne instruments. The instrumentation used for making these measurements is described and a summary is also given of the flights made with this instrumentation. (Author)

**AD-625 439 Fld. 4/1, 18/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL RESEARCH LAB WASHINGTON D C*
**ATMOSPHERIC RADIOACTIVITY IN ANTARCTICA 1956-1963.**
Final rept.,
by L. B. Lockhart,Jr., R. L. Patterson,Jr., and A. W. Saunders,Jr.. 3 Nov 65, 21p. Rept. no. nrl-6341
Proj. RR-004-02-42-5151 ,AEC-AT-49-7 (2435)

Unclassified report

Descriptors: (*Antarctic region, Radioactivity), (*Radioactivity, Antarctic regions), Atmosphere, Radioactive fallout, Fission products, Radon, Decay schemes, Airborne, Radioactive decay, Aerosols

Continuous measurements of the radioactive aerosol content of the surface air in Antarctica have been made since 1956, first at Little America and later at the Amundsen-Scott South Pole Station. Both the radioactivity due to bomb-produced fission products and to the naturally occurring radionuclides of the radon and thoron series were measured in daily collections; composite samples covering three-month periods were subjected to radiochemical analysis for such long-lived radionuclides as Sr (90), Cs (137), Ce (144), Pm (147), and Pb (210). The observed natural radioactivity was lower in Antarctica than at any other geographical location, as might be expected from the absence of any quantity of exposed land surface in the vicinity. The fission-product concentrations, however, were equal to or greater than those observed in the southernmost parts of South America. Well-defined seasonal variations in airborne radioactivity were noted, with maxima in the summer. (Author)

**AD-625 480 Fld. 4/1, 20/9**
**CFSTI Prices: HC $4.00 MF $1.00**
*GENERAL ATOMIC SAN DIEGO CALIF JOHN JAY HOPKINS LAB FOR PURE AND APPLIED SCIENCE*
**ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERIC GASES.**
Yearly technical summary rept., 1 Sep 64-31 Aug 65,
by R. F. Stebbings, M. A. Fineman, J. W. McGowan, and B. R. Turner. 1 Dec 65, 133p. Rept. no. ga-6699
Contract DA-49-146-XZ-354 Proj. GA-456 DASA 1708

Unclassified report

Descriptors: (*Gas ionization, Upper atmosphere), (*Upper atmosphere, Gas ionization), Ions, Molecules, Electrons, Nitrogen, Hydrogen, Electrostatics, Photochemistry, Reaction kinetics, Plasma physics

Collisions involving charge transfer and charged rearrangement between some of the positive ions and neutral molecules present in the earth's upper atmosphere have been investigated in a crossed beam experiment at energies within the range 2 to 200 eV. The charged reaction products are identified in a mass spectrometer, and absolute cross sections for their production are obtained. Interpolation between these values and those obtained at thermal energy in afterglow experiments provides information on the variation of the cross sections with energy in the intervening energy interval. The influence of excited ions is examined in some detail. Ionization of N2 and H2 just above threshold has been investigated using monoenergetic electrons obtained with a 127-deg electrostatic energy selector. In both cases there was evidence of ionization occurring by autoionization as well as direct ionization. The agreement between our electron impact results and those obtained by photoionization for the autoionization processes is compared. In the case of H2, we have interpreted the structure in the second-derivative electron impact spectrum to be due to the rotational states of H2 and H2 (+) taking part in the ionization process. (Author)

**AD-625 551 Fld. 4/1, 12/1, 20/4**
*MINNESOTA UNIV MINNEAPOLIS*
**THE METHOD OF WEIGHTED RESIDUALS AND ITS RELATION TO CERTAIN VARIATIONAL PRINCIPLES FOR THE ANALYSIS OF TRANSPORT PROCESSES,**
by B. A. Finlayson, and L. E. Scriven. 20 Aug 64, 10p. Contract AF-AFOSR-219-63 AFOSR 65-2208

Unclassified report

*Availability: Published in Chemical Engineering Science v20 P395-404 1965. Copies to DDC users only.*

Descriptors: (*Heat transfer, Fluids), (*Calculus of variations, Statistical analysis), (*Approximation (Mathematics), Heat transfer), Transport properties, Chemical engineering

The approximation scheme entitled method of weighted residuals is extended to systems of differential equations and vector differential equations. The variational principles proposed by Rosen, Chambers and Biot for unsteadystate heat transport are all shown to be applications of the method of weighted residuals. The von-Karman-Pohlhausen method and the method of moments are also shown to be special cases. The method is illustrated by application to the problem of unsteady heat transfer to a fluid in ideal stagnation flow. (Author)

**AD-625 600 Fld. 4/1, 20/8**
*ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL*
**NEUTRON MONITOR MASS ABSORPTION COEFFICIENTS AT CHICAGO AND CLIMAX DURING SOLAR CYCLE 19 (1954-1963).**
Revised ed.,
by Miriam A. Forman. 15 Mar 65, 5p. Contract AF-AFOSR-521-64 AFOSR 65-1820

Unclassified report

Revision of manuscript submitted 2 Nov 64.

*Availability: Published in Journal of Geophysical Research v70 n11 p2469-73 1 Jun 1965. Copies to DDC users only.*

Descriptors: (*Cosmic rays, Neutron spectrum), (*Neutron absorption, Atmosphere), Neutron detectors, Mass spectrum, Barometric pressure, Correlation techniques

The dependence of the neutron monitor mass absorption coefficient on 11-year changes in the primary cosmicray spectrum was investigated for the monitors at Chicago, Illinois, and Climax, Colorado, using a modified single regression method. The analysis of hourly intensity and pressure values for 733 days at Chicago and 1000 days at Climax during the period 1954-1963 revealed no significant variation at either station. The mean value of the coefficient at Chicago is -0.938 = 0.007%/mm Hg; at Climax it is -1.010 = 0.006%/mm Hg. This difference is significant and depends on the altitude characteristics of the nucleonic component. These results are compared with earlier work. (Author)

**AD-625 116 See Fld. 20/6**

**AD-625 124 See Fld. 20/6**

**AD-625 131 See Fld. 3/2**

**AD-625 313 See Fld. 20/8**

**AD-625 335 See Fld. 4/2**

**AD-625 340 See Fld. 5/1**

**AD-625 481 See Fld. 4/2**

## 4/2. METEOROLOGY

**AD-624 948 Fld. 4/2, 20/6, 17/5**
*ARMY ELECTRONICS LABS FORT MONMOUTH N J*
**APPLICATION OF INFRARED RADIOMETERS TO METEOROLOGY,**
by Andrew C. Combs, Helmut K. Weickmann, Christopher Mader, and Albert Tebo. 5 Oct 64, 10p.

Unclassified report

*Availability: Published in Journal of Applied Meteorology, v4 n2 p253-62 Apr 1965. Copies to DDC users only.*

Descriptors: (*Infrared equipment, Radiometers), (*Radiometers, Infrared equipment), (*Meteorological instruments, Radiometers), Surface temperatures, Earth, Infrared radiation, Measurement, Airborne. Infrared optical systems

Various types of infrared radiometers have been used to make measurements of surface temperature from aircraft and to make measurements of temperature during cloud traverses. Instruments for surface temperature are sensitive in the water-vapor window 8 to 13 microns and in the range from 8 to 35 microns, and instruments for cloud temperature are sensitive in the 15 microns CO2 band. The instrumentation shows great promise for operational measurement of surface temperature from aircraft. The infrared atmospheric thermometer (IRAT) (15 microns CO2 band) makes it possible to measure free-air and in-cloud temperatures remotely without actual exposure to the cloud droplets which cause errors in other types of sensors. Relative accuracy of the IRAT is =0.25C. (Author)

**AD-625 094 Fld. 4/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*UNITED AIRCRAFT CORP EAST HARTFORD CONN*
**TERMINAL WEATHER PREDICTION TECHNIQUES.**
Final rept. 1 Oct 64-30 Sep 65,
by Russell G. Harris, and James E. MacMonegle. Nov 65, 37p. Contract AF19 (628)-3437 Proj. AF-433L ESD TR-65-477

Unclassified report

Subcontracted to Travelers Research Center, Inc., Hartford, Conn. pub. no. 7463-193.

Descriptors: (*Weather forecasting, Statistical analysis), Micrometeorology, Meteorological parameters, Dynamic programming

Regression equations were applied to hemispheric and 24- and 48-hr prognostic charts produced by the Global Weather Central's 6-level dynamical model to obtain diagnostic and predicted total-cloud-amount patterns. The equations were derived in previous research to express total-cloud amount as a function of parameters defined by concomitant 500-, 700-, and 1000-mb height fields. The total-cloud-amount patterns resulting from the use of these equations in this study were verified by comparing them to total-cloud-amount nephanalyses constructed at the Global Weather Central. The diagnostic skill previously shown by the equations on U. S. station data was maintained over other dense-data mid-latitude areas of the hemisphere. Skill measures were lower when sparse-data (i.e., oceanic) regions were included in the test areas. This deterioration is ascribed to poorer definition of the upper-level predictor fields, or nephanalysis inaccuracies, or both, in these regions. The mid-latitude diagnostic skill of the equations deteriorated about 30 percent when they were applied to 24-hr prognoses, and from 50 to 70 percent at 48 hours. The equations showed little or no skill in tropical or subtropical latitudes, probably because of the effect of advective predictor parameters based on geostrophic assumptions. (Author)

**AD-625 123 Fld. 4/2**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS METEOROLOGY LAB*
**OZONE AND TEMPERATURE STRUCTURE IN A HURRICANE.**
Environmental research papers,
by Samuel Penn. 27 Nov 64, 15p. Rept. no. erp-126
Proj. AF-8631 Task 863102
AFCRL 65-629
Unclassified report

Revision of manuscript submitted 27 Jul 64.

*Availability: Published in The Journal of Applied Meteorology v4 n2 p212-6 Apr 1965. Copies to DDC users only.*

Descriptors: (*Ozone, Tropical cyclones), (*Tropical cyclones, Ozone), (*Hurricane tracking, Atmospheric sounding), Marine meteorology, Storms, Thermal properties, Meteorological parameters, Atlantic Ocean, Research aircraft

For the first time detailed ozone measurements were obtained in a hurricane. An instrumented U-2 airplane was flown into hurricane Ginny on 22 October 1963 off the South Carolina coast. The hurricane core was over-flown at several altitudes and observations of ozone and the standard meteorological variables were obtained from 50 mb (67,000 ft) to 300 mb (30,000 ft). Supplemental temperature data were available below 700 mb from two dropsondes. From the above observations and by including some information about the mean thermal structure in a hurricane similar to Ginny, an 'eye' sounding was constructed from sea level up to 50-mb level. Some nearby environmental data above 200 mb were available, and more distant observations were obtained from the coastal radiosondes and an ozonesonde released at Tallahassee. Analysis of the data suggested that the warm core extended only up to 200 mb, cloud top height. Between 190 and 119 mb (tropopause height), horizontal gradients of ozone and temperature were poorly defined. Above the tropopause and up to 105 mb the region over the eye was warmer and considerably richer in ozone. In the layer from 100 to 50 mb, the horizontal gradients again became very weak. (Author)

**AD-625 180 Fld. 4/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS*
**HEAT FLUX AND SURFACE STRESS ON AND NEAR AN ISLAND IN THE TRADE WIND REGION.**
Interim rept. no. 6, 15 Jun-15 Sep 65,
by E. B. Kraus. 15 Sep 65, 20p. Rept. no. ref-65-56
Contract DA-36-039-SC-90784 Task 1VO-14501-B-53A-09
Unclassified report

Descriptors: (*Marine meterology, West Indies), (*West Indies, Marine meteorology), Convection (Atmospheric), Wind, Boundary layer, Surface area, Oceans, Hydrodynamics

The present state of work under the contract is reviewed. It is then shown that the drag coefficient over water is likely to be a function of fetch and wind duration. Observational data are analyzed to specify this relationship. The boundary layer over water is discussed. A double viscous sublayer characterizes the existing regime. Boundary layer separation appears to be a relatively rare event. The motion field has the character of a smooth flow over large parts of the sea surface. The investigation indicates that spray plays only a minor role in momentum transfer, at least at wind velocities below 10 meters per second. A theory has been established for the time-dependent depth and temperature of the midocean surface layer as a function of the interaction with the atmosphere. Large-scale circulation studies which include the effects of oceans on continent and the effects of seasons, were concluded. They will be resumed in a more sophisticated form at a later stage. Processing of Aruba data continues. (Author)

**AD-625 188 Fld. 4/2, 14/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS AEROSPACE INSTRUMENTATION LAB*
**A SYSTEM FOR THE DETERMINATION OF THE VERTICAL WIND PROFILE FROM AN AIRCRAFT.**
Instrumentation papers,
by James F. Morrissey. Sep 65, 19p. Rept. no. ip-79
Proj. AF-6020 Task 602002
AFCRL 65-704
Unclassified report

Descriptors: (*Anemometers, Radiosonder), (*Winddirection indicators, Radiosonder), (*Atmospheric sounding, Research aircraft), Airborne, Meteorological instruments, Wind, Configuration

This paper defines a proposed system for obtaining a vertical profile of the winds beneath an aircraft. It would be a low-cost system that would not place any restrictions on the track of the aircraft. The paper also attempts to define some of the problem areas associated with development of the system, and to demonstrate that these problems are not insurmountable. (Author)

**AD-625 216 Fld. 4/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*DEUTSCHER WETTERDIENST OFFENBACH AM MAIN (WEST GERMANY)*
**THE NULL LAYER CONCEPTION IN STRATOSPHERE AND MESOSPHERE, ESPECIALLY IN SPRING AND FALL.**
Special technical scientific rept. no. 1 on the Cell Structure of the Atmosphere,
by Heinrich Faust. Jan 63, 29p. Contract DA-91-591-EUC-2174
Unclassified report

Descriptors: (*Air mass analysis, Upper atmosphere), (*Wind, Upper atmosphere), (*Atmospheric motion, Climatology), Stratosphere, Atmospheric sounding

'Null layer' refers to a persistent layer of extreme wind which has the characteristic quality of reversing a large scale vertical motion.

**AD-625 335 Fld. 4/2, 4/1, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*TECHNOLOGY INC DAYTON OHIO*
**MEASUREMENT OF WIND SHEAR.**
Quarterly rept. no. 1, 15 Dec 64-16 Mar 65,
by M. S. Phillips, T. W. Temple, and M. C. Eifert. Nov 65, 47p. Contract DA-28-043-AMC-00384 (E) Proj. DA-1VO-14501-B-53A-11 ECOM 00384-1
Unclassified report

Descriptors: (*Wind, Measurement), (*Probes, Meteorological instruments), (*Meteorological instruments, Probes), (*Atmospheric sounding, Probes), Accelerometers, Magnetometers, Mathematical models, Calibration, Flight testing

Several mathematical models were developed to analytically explain the outputs from the wind shear probe accelerometers and magnetic aspect sensor. The methods developed were then applied to samples of recorded data to determine the effects of the various parameters upon calculated output. The results were neither consistent nor conclusive. The models developed considering small time interval approximations were too dependent upon reading accuracy. Additional work was directed toward improving the capability of the instrumentation system of the probe. Some temperature testing was conducted and circuit modifications and battery requirements were finalized. Modifications to the probe configuration were made to eliminate problem areas uncovered during the flight testing program. These were incorporated into the design and have been included in the probes under construction. (Author)

**AD-625 348 Fld. 4/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF METEOROLOGY*
**INITIALIZATION OF PRIMITIVE-EQUATION MODELS FOR NUMERICAL WEATHER PREDICTION.**
Final rept., pt. 1, 22 Mar 60-31 Dec 63,
by Warren M. Washington. Dec 64, 96p. Contract AF19(604)-7261 AFCRL 64-1005-Pt-1
Unclassified report

Descriptors: (*Weather forecasting, Mathematical models), (*Atmosphere models, Differential equations), (*Differential equations, Atmosphere models), Meteorological parameters, Mathematical analysis, Calculus of variations

Numerical weather prediction models of the primitive equation type generate spurious gravity-inertial waves, detrimental to the forecast, if the initial wind and height fields are not in proper balance. In this thesis a new method of obtaining balanced initial fields is developed and demonstrated. The method uses calculus of variations to blend the observed wind and height information to yield an analyzed wind stream function through the use of wind vorticity and two forms of the balance equation. The contribution of the observed winds and heights to the analyzed stream function varies with wave length in a prescribed manner. This analyzed stream function is inserted into a complete form of the balance equation which is then solved for a new height field. With the analyzed stream function and new height fields some form of the omega-equation can be solved. The particular form of the omega-equation used depends upon the type of forecasting model. From omega and/or divergence the velocity potential can be solved. Finally, from the stream function and velocity potential fields a new wind field is computed. The new wind and height fields constitute balanced initial data for primitive equation numerical weather prediction models. (Author)

**AD-625 360 Fld. 4/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*WEATHER BUREAU WASHINGTON D C*

**THE DIURNAL VARIATION OF THE VECTOR SURFACE WIND AT SEVERAL ICE CAP STATIONS.**
Interim rept. no. 5, 15 Mar-15 Sep 64,
by W. L. Schallert. 15 Sep 64, 90p. Proj. DA-1V0-14501-B-53A Task 1V0-14501-B-53A-05
Unclassified report

Studies on the Meteorology of Greenland.

Descriptors: (*Wind, Greenland), Arctic regions, Ice islands, Weather stations, Atmospheric motion, Boundary layer, Diurnal variations, Vector analysis

Diurnal variations of the mean surface wind vector at four stations on the slope of the Greenland ice cap east of Thule are examined for each of twelve consecutive months. In each case all possible harmonic components were calculated. The first (diurnal) harmonic is generally found to be the dominant component though this fact is usually well masked in the 'curves' which the periodic functions are intended to reproduce. Diurnal control of the wind vector is greatest at the highest of the four stations. It appears that the observed diurnal variation of the vector wind is a consequence of a wide varity of atmospheric disturbances whose nature the analysis technique is powerless to describe. (Author)

**AD-625 388 Fld. 4/2, 22/2, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**EVALUATION OF METEOROLOGICAL ROCKET WIND SENSORS.**
Technical rept.,
by Marvin J. Lowenthal. Dec 64, 26p. Rept. no. ecom-2537
Proj. DA1V0-14501-B-53A Task 1V0-14501-B-53A-03
Unclassified report

Descriptors: (*Wind, Measurement), (*Atmospheric sounding, Sounding rockets), (*Sounding rockets, Instrumentation), Meteorological instruments, Probes, Satellite networks, Meteorological parameters, Climatology

Data from the Meteorological Rocket Network have been used to evaluate the wind sensors from the standpoint of wind speed and wind variability. To investigate the wind variability at any given location, pairs of rocket firings were selected with a time interval of 24 hours. The variations of the wind for this period were examined to determine if there was any significant difference in the values depending on whether the sensors were chaff, chute, or a chaff-chute combination. Analysis of the data indicates that the 24-hour mean vector wind differences are (1) a function of wind speed, and (2) independent of sensor. (Author)

**AD-625 481 Fld. 4/2, 22/2, 4/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*SPACE DATA CORP PHOENIX ARIZ*
**DESIGN, DEVELOPMENT AND FLIGHT TEST RESULTS OF THE LOKI INSTRUMENTED DART SYSTEM.**
Final scientific rept., May 64-Oct 65,
by Robert L. Walker. Oct 65, 73p. Rept. no. sdc-TM-92
Contract AF19 (628)-4164 Proj. AF-6682 Task 668206
AFCRL 65-844
Unclassified report

Descriptors: (*Sounding rockets, Instrumentation), (*Meteorological instruments, Sounding rockets), (*Atmospheric sounding, Sounding rockets), Launch vehicles (Aerospace), Payload, Telemeter systems, Experimental design, Flight testing

The Instrumented Dart System is the upper stage of the Loki Dart meteorological sounding vehicle designed to measure vertical profiles of temperature and winds between 200,000 feet and 75,000 feet altitude. The purpose of this effort was to design and flight test the complete Instrumented Dart compatible with the Loki type motor. The components of the Instrumented Dart include the Dart assembly, time delay and expulsion system, telemetry system, temperature sensor, and parachute. The telemetry system was designed to be compatible with the Raw in Set AN/GMD-1B and associated equipment such as the radiosonde receiver AN/TMQ-5C. Flight tests of the system were conducted at White Sands Missile Range, New Mexico and the Air Force Eastern Test Range, Cape Kennedy, Florida. Results from these tests demonstrated the feasibility of using a Loki Dart type vehicle for measurement of upper atmosphere winds and temperatures. (Author)

**AD-625 621 Fld. 4/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**THE STRUCTURE OF THE FIELDS OF WIND-VELOCITY AND TEMPERATURE IN THE SURFACE LAYER OF THE ATMOSPHERE,**
by A. S. Monin. 1965, 30p. Rept. no. translation-1044
TT 66-60108
Unclassified report

Trans. of Akademiya Nauk SSSR. Institut Fiziki Atmosfery. Trudy n4 p5-20 1962.

Descriptors: (*Micrometeorology, Atmospheric motion), (*Atmospheric motion, Micrometeorology), Atmosphere, Boundary layer, Turbulence, Surface area, Earth (Planet), Meteorology, USSR

This review considers the currently available theoretical and empirical knowledge concerning the wind velocity and temperature fields in the surface layer of the atmosphere. Attention is concentrated on those characteristics that can be measured directly. The surface layer will denote that lower layer of the atmosphere -- having a thickness of a few tens of meters -- in which the effect of the Coriolis force can be neglected.

**AD-625 137** **See Fld. 4/1**

**AD-625 195** **See Fld. 15/7**

**AD-625 354** **See Fld. 14/2**

**AD-625 427** **See Fld. 8/6**

## 5/1. ADMINISTRATION AND MANAGEMENT

**AD-625 002 Fld. 5/1, 12/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**THE SYSTEM VIEW AND THE DISENCHANTED EXECUTIVE.**
Professional paper,
by Roy Davison. 16 Nov 65, 18p. Rept. no. sp-1523/000/00
Unclassified report

Descriptors: (*Systems engineering, Management planning), (*Management planning, Systems engineering), Operations research, Management engineering

We increasingly hear that user involvement is necessary in developing systems. A number of forces militate against user involvement. Both users and system specialists must reshape certain attitudes and develop certain skills if users are effectively to be involved in system design and development. (Author)

**AD-625 340 Fld. 5/1, 4/1, 22/2, 21/2, +**
**CFSTI Prices: HC $3.00 MF $0.75**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**FOREIGN SCIENCE BULLETIN, 1965, VOL. 1, NO. 12.**
Dec 65, 62p. TT 66-60086
Unclassified report

A monthly review of selected foreign scientific and technical literature sponsored by the Department of Defense. See also AD-624 121.

Descriptors: (*Scientific research, Reviews), USSR, Cosmic rays, Sun, Atmosphere, Spacecraft, Gravity, Acceleration, Flames, Combustion, Stability, Alloys, Lightning, Electrostatics, Documentation, State-of-theart reviews, Radiofrequency power, Magnetic fields, Plasticity, Symposia

Contents: Primary cosmic rays of the sun and their decomposition into secondary components in the terrestrial atmosphere; Optimum acceleration of a spacecraft in a central field; combustion stability of spherical flames; theory of optimal alloying; energy of ball lightning; scientific and documentation activities in the Soviet Union; use of a pulsed magnetic field in microwave power generation; loosening of solids in plastic state; activities of the Armenian Academy of Sciences; relativistic astrophysics (USSR); quantum electronics research (USSR); scientific session on the application of nuclear methods to solid-state physics (USSR); conference on spectroscopy; conference on the theory and applications of explosions; Serafim Nikolayevich Zhurkov; and Zakhar Aleksandrovich Rogovin.

**AD-625 472 Fld. 5/1, 14/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**THE EFFICIENT ACHIEVEMENT OF RAPID TECHNOLOGICAL PROGRESS-A MAJOR NEW PROBLEM IN PUBLIC FINANCE,**
by Richard R. Nelson. Dec 65, 16p. Rept. no. p-3286
Unclassified report

Descriptors: (*Research program administration, Costs), (*Management engineering, Production), Federal budgets, Scientific research, Economics, Decision making, Cost effectiveness, Systems engineering, Defense systems

A discussion is presented on the following topics: Characteristics of the R and D process--outputs, inputs, and kinds of projects; Special characteristics of the R and D process; Conjectures about efficient R and D policy; The role of conventional benefit--cost calculations; A central question--probing the technological frontiers in systems development, or in research and independent component developments; Objectives of research and independent component developments--facilitating better systems choices and expanding the range of nonrisky alternatives; The running of systems developments-the importance of hedging.

**AD-625 003** **See Fld. 9/2**

## 5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY

**AD-624 890 Fld. 5/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**THE TRANSFORMATION OF SENTENCES FOR INFORMATION RETRIEVAL,**
by Jane J. Robinson. Dec 65, 14p. Rept. no. p-3243
Unclassified report

Prepared for presentation at the 1965 Congress of International Federation for Documentation (FID), Washington, D. C., October 1965.

Descriptors: (*Information retrieval, Transformational grammars), (*Transformational grammars, Information retrieval), Grammars, Linguistics

**AD-625 027 Fld. 5/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*AMERICAN CHIROPRACTIC ASSOCIATION WASHINGTON D C DEPT OF RESEARCH AND STATISTICS*
**UNITERMS AND THE LEARNING CURVE,**
by Henry G. Higley. 1965, 15p.
Unclassified report

Prepared for presentation at Meeting and Congress (31st), International Federation for Documentation (FID), Washington, D. C., 7-16 Oct 65.

Descriptors: (*Subject indexing, Curve fitting), Statistical tests

Studies were made of the characteristics of the input of uniterms, for coordinate indexing, over a short period of time, more specifically, the frequency of uniterm cards with a given number of entries derived from input. For a set of 500 documents of the American Chiropractic Assn. input over 3 months, there were 258 uniterm cards with 2755 accession numbers, i.e. 10.68 average of accession numbers per uniterm card and 5.51 average number of uniterms per document. The frequency of uniterms with a given number of entries closely followed the learning or progress curve $y = ax$ to the b power, with the exception of $x = 1$. Study of similar data from the uniterm index of the Pacific Aeronautical Library of the American Institute of Aeronautics gave similar results. In this curve, the x axis is the number of documents/uniterm card, the y axis the number of uniterm cards. The parameter a is thought to depend on the size of the collection, while b is a measure of the rate of change of y for values of x and for these collections is thought to be a function of the characteristics of the sets of documents and of the methods of analysis and coding. The class $x = 1$ may be interpreted as representing new concepts or older concepts being replaced by new ideas.

**AD-625 029 Fld. 5/2, 14/5, 9/2**
**CFSTI PricesMF $0.75**
*SOCIETY OF PHOTOGRAPHIC SCIENTISTS AND ENGINEERS WASHINGTON D C*
**1965 SYMPOSIUM ON PHOTOGRAPHY IN INFORMATION STORAGE AND RETRIEVAL, OCTOBER 21-23, 1965.**
1965, 104p.
Unclassified report

Research sponsored in part by ARO.

*Availability: Hard copy available from Society of Photographic Scientists and Engineers, Box 1609, Washington, D. C. 20013. $5.00.*

Descriptors: (*Information retrieval, Photography), (*Photography, Information retrieval), Symposia, Lasers, Photographic recording systems, Film readers, Electrophotography, Thermoplastics, Microfilm, Television display systems, Patents, Drives, Meteorological satellites, Cathode ray tubes, Phosphorescent materials, Photographic film, Glass, Electron beams, Thermoplastics, Optics, Computers, Analog systems, Electrooptical photography

Contents: Information properties: Legibility as a measure of copy system performance; Laser beam scanning for high-density data extraction and storage; Recording spot size and spatial frequency; Information processing with an automatic film reader; Screening in thermoplastic xerography. Systems: Photography in information transfer; Operational considerations for an information storage and retrieval system; Document retrieval requirements and solutions; High-speed system for handling of microform documents; Videofile system; TMCL - 70mm slide retrieval, display and print-out system; Micro-Vue. Read-in, read-out: Patent searching; System for automatic high-reduction microphotography; Flash processing for information retrieval; Weather satellite digital and analog display system; Precision mechanical drives; CRT phosphor activation of photochromic film; Random access photo overlay projection for data readouts; One-step printout from computer to finished page. Storage: Information storage density; Recording digital data on photographic film using superimposed grating patterns; Quasi parallel read-out of a coded image file; Photochromic glass as a storage medium; Thermoplastic imaging; Electron beam recording on photographic film; Information storing properties of extended range film; Photo-optical recording of digital information.

**AD-625 193 Fld. 5/2, 16/4.3**
**CFSTI Prices: HC $3.00 MF $0.75**
*VITRO LABS SILVER SPRING MD*
**THE DEFINITION OF REQUIREMENTS FOR A SEALAUNCHED MISSILE INFORMATION-ANALYSIS CENTER.**
Technical note,
by Frank A. DiBello, and Heino Viil. Nov 65, 65p. Rept. no. vitro-TN-01856.01-4
Contract 534
Unclassified report

Descriptors: (*Guided missiles (Underwater-tosurface), Documentation), (*Libraries, Guided missiles (Underwater-to-surface)), Subject indexing, Information retrieval, Classification

Conclusions and recommendations: (1) A Sea-Launched Missile Information-Analysis Center should be established to monitor all SLM studies and to provide a single access point for all SLM information. (2) The scope of coverage of the SLM Center, as defined in section II of this report, would consist of those categories that directly pertain to the SLM problem. (3) The immediate source volume is estimated to be 1910 titles for the year 1965. The projected source volume for the year 1970 is a total of 4960 titles in the Center with an acquisition rate by that year of 62 documents per month. (4) It is estimated that by 1970, the Center would be answering as many as 25 information requests per month. (5) It is recommended that the Sea-Launched Missile Information-Analysis Center employ a manual, nonhierarchic, concept-coordination indexing system using a limited set of well-defined descriptors for indexing each item. (6) The SLM Center should be responsible for basic analysis functions in all or part of the SLM subject matter.

**AD-625 208 Fld. 5/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*MCDONNELL AIRCRAFT CORP ST LOUIS MO*
**ACRONYMS,**
by M. Bonnell, W. Carr, and C. Lauer. 1 Dec 65, 76p.
Unclassified report

Descriptors: (*Libraries, Vocabulary), (*Vocabulary, Libraries), (*Documentation, Libraries), Engineering, Reports

A list is given of acronyms and abbreviations that are being used in the McDonnel Aircraft Technical Library. This list contains the acronym, its meaning, and source from which it was originated. (Author)

**AD-625 409 Fld. 5/2, 9/2, 5/7**
**CFSTI Prices: HC $3.00 MF $0.75**
*RAND CORP SANTA MONICA CALIF*
**RELATIONAL DATA FILE: A TOOL FOR MECHANIZED INFERENCE EXECUTION AND DATA RETRIEVAL,**
by Roger Levien, and M. E. Maron. Dec 65, 100p. Rept. no. rm-4793-PR
Contract AF49 (638)-1700 Proj. RAND
Unclassified report

Descriptors: (*Information retrieval, Data processing systems), (*Computational linguistics, Data processing systems), Dictionaries, Syntax, Automatic, Data, Computer logic, Coding, Programming (Computers), Language, Cybernetics, Programming languages

A description of the background and status of a current project on automatic data storage and retrieval. The research emphasizes the development and testing of logical techniques for data retrieval and inference-making. The techniques are being implemented in the form of computer routines, and tested on a large body of facts concerning the field of cybernetics. Various sections present the theoretical base of the proposed system, a summary of the theory of relations, typical data retrieval requests, the key problems of inference, techniques for practical realization of the data file, output problems, storage and processing problems, the data file as a whole, the question of literature searching, and future steps to be taken to extend the capability of the system. (Author)

**AD-625 496 Fld. 5/2**
*OFFICE OF AEROSPACE RESEARCH WASHINGTON D C*
**TOWARD A NATIONAL TECHNICAL INFORMATION SYSTEM,**
by A. G. Hoshovsky, and H. H. Album. 1965, 10p. Rept. no. oar-65-13
Unclassified report

Prepared in cooperation with Stanford Univ., Calif. Dept. of Mechanical Engineering.

*Availability: Published in American Documentation v16 n4 p313-22 Oct 1965. Copies to DDC users only.*

Descriptors: (*Documentation, United States Government), (*Scientific research, Documentation), Abstracts, Processing, Subject indexing, Information retrieval, Libraries, Dissemination

Factors are presented which are said to inhibit the efforts toward building a truly national technical information network. These factors are: (1) The lack of acceptable plans to provide blueprints for the future. (2) The fear of present groups of losing the autonomy of operations. (3) The absence of a conscious cooperation between the government and the private sectors of the information-handling community. A conceptual framework is outlined that is regarded as a possible basis for an acceptable information system. The heart of the proposal is the division of work among the government and nongovernment groups. It provides for orderly collection of all scientific and technical literature, a central switching mechanism (the National Technical Information Agency), and the decentralized handling of abstracting, indexing and distribution functions. Storage is carried out both centrally and decentrally to provide maximum access to the information. This would provide access to the total store of technical literature in any desired area and at any level in the system. A joint government/nongovernment policy mechanism is proposed. (Author)

**AD-625 498 Fld. 5/2, 9/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY WASHINGTON D C*
**1965 CONGRESS, INTERNATIONAL FEDERATION FOR DOCUMENTATION (FID), 10-15 OCTOBER 1965, WASHINGTON, D. C.; ABSTRACTS.**
Oct 65, 96p. Contract AF49 (638)-1561 Proj. AF-9769 Task 976901
AFOSR 65-1891
Unclassified report

Descriptors: (*Documentation, Symposia), Abstracts, Education, Training, Eastern Europe, Pakistan, Libraries, South America, Sweden, Information retrieval, Canada, France, Japan, West Germany, Management planning, Transformational grammars, Classification, Computers, Optical scanning, Punched tape, Man-machine systems

The booklet contains abstracts of symposium papers and contributed papers presented at the 1965 Congress. Symposium abstracts are grouped in five topic areas: (1) education and training of documentalists, (2) organization of information for documentation, (3) information needs of science and technology, (4) information needs of society, and (5) principles of documentation and systems design. Contributed abstracts are arranged alphabetically by name of the first author. An author index is included. (Author)

**AD-625 509 Fld. 5/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*OFFICE OF AEROSPACE RESEARCH WASHINGTON D C*
**AVAILABILITY OF SCIENTIFIC JOURNALS IN DEFENSE ORIENTED LIBRARIES,**
by James A. Fava, and Alexander G. Hoshovsky. 1 Nov 65, 56p. Rept. no. oar65-10
Unclassified report

Descriptors: (*Air force, Scientific research), (*Department of Defense, Scientific research), (*Periodicals, Scientific research), (*Libraries, Scientific research), Industries, Universities

The objective was to determine the availability of OAR sponsored research to the Air Force technological community when they are published solely in open journals. The data was obtained through a survey of technical libraries in 199 defense-oriented research establishments. The librarians were asked to mark 'on shelf' each of the 522 journal titles in which OAR research is published. The findings indicate that less than 50 percent of these journals are readily available; that the university libraries are the most likely places for finding these journals; and that defense and industrial libraries are the least likely places to find them. The hypothesis is rejected that the professional journals in which OAR sponsored researchers normally publish are readily available (on-shelf) in defense-oriented libraries. (Author)

**AD-625 577 Fld. 5/2**
*WESTERN RESERVE UNIV CLEVELAND OHIO CENTER FOR DOCUMENTATION AND COMMUNICATION RESEARCH*
**USE OF META-LANGUAGE IN INFORMATION RETRIEVAL SYSTEMS,**
by W. Goffman, J. Verhoeff, and Jack Belzer. 1960, 12p. Contract AF49 (638)-357 Grant AF-AFOSR-403-63 AFOSR 65-1520
Unclassified report

Prepared in cooperation with Delft Technical Univ. (Netherlands).

*Availability: Published in American Documentation v15 n1 p14-22 Jan 1964. Copies to DDC users only.*

Descriptors: (*Information retrieval, Language), Subject indexing, Abstracts, Processing

The article attempts to point out the usefulness of metalanguage in designing information retrieval systems. In its three sections, it first, sets the stage for the introduction of the meta-language concept with general remarks on information retrieval systems. Second, it discusses meta-language in general. Last, it considers certain theoretical implications pointing to the implementation of meta-language in literature-searching systems. (Author)

**AD-625 340** **See Fld. 5/1**

## 5/3. ECONOMICS

**AD-624 893 Fld. 5/3, 15/3, 15/1**
**CFSTI Prices: HC $5.00 MF $1.00**
*MITRE CORP BEDFORD MASS*
**SYSTEM COST ANALYSIS: A MANAGEMENT TOOL FOR DECISION MAKING,**
by M. V. Jones. Nov 65, 190p. Rept. no. tm-04063
Contract AF19 (628)-2390 Proj. AF-850 ESD TR-65-405
Unclassified report

Descriptors: (*Armed forces operations, Costs), (*Decision making, Management planning), Systems engineering, Military requirements, Command + control systems, Weapon systems, Operations research

A generalized, integrated conceptual approach is presented for the major steps involved in estimating the costs of a military system. The common methodological problems and tasks involved in costing all military systems are identified. The entire process of costing a system is discussed and the methodological relationships of each sequential step to preceding and subsequent steps are shown. Fundamental principles are stressed as opposed to a catalog of resource costs and estimating relationships or a case book detailing the specific procedures used to cost particular systems in the past. The approach is task oriented in the sense that discussion centers around such highly practical questions as the following: what an analyst should learn about the client's intended application of the estimate and about the details of the system he is to cost before he begins the costing task itself; the criteria an analyst can use to help him realize the greatest benefit in a limited time; the types of activities and resources he should cost and in what detail; the types of data he should seek as a basis to cost such activities and resources, and the sources from which he should try to collect these data; how he should proceed to evaluate and synthesize his data inputs to arrive at his system cost estimate; how he should present the details of his findings to be most meaningful to his client. (Author)

**AD-624 894 Fld. 5/3, 15/3, 15/1**
**CFSTI Prices: HC $4.00 MF $0.75**
*MITRE CORP BEDFORD MASS*
**A COMPUTERIZED TECHNIQUE TO EXPRESS UNCERTAINTY IN ADVANCED SYSTEM COST ESTIMATES,**
by S. Sobel. Nov 65, 115p. Rept. no. tm-03728 Contract AF19 (628)-2390 Proj. AF-850 ESD TR-65-79
Unclassified report

Descriptors: (*Armed forces operations, Costs), (*Costs, Uncertainty), Weapon systems, Systems engineering, Programming (Computers), Probability

The technique described presents a method to express uncertainty quantitatively in advanced system cost estimates. In particular, the technique suggests the employment of subjective probability distributions, which describe the uncertainty in each system element, to determine an approximate distribution for total system cost. A 7090 program was written to perform the computational operations. (Author)

**AD-624 902 Fld. 5/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**THE RATE AND PATTERN OF INDUSTRIAL GROWTH IN COMMUNIST CHINA,**
by K. C. Yeh. Dec 65, 12p. Rept. no. p-3277
Unclassified report

Review prepared for publication in the American Economic Review.

Descriptors: (*Industrial production, China), (*Economics, China), Industries, Employment, Wages, Statistical analysis, Reviews

The book being reviewed consists of four main chapters. The first discusses briefly the various formulae of production indexes. The second examines the major deficiencies in the way the Communist Chinese statisticians compute their industrial production index. The third explains in detail the construction of the two new indexes, one including and the other excluding handicraft output. The fourth evaluates the new indexes, comments on the rates of growth, and compares them with an estimate by Liu-Yeh and with those of other countries. The book also contains three appendices dealing with: the effects of industrialization and production indexes, the industrial ministries of Communist China, and statistical tables.

**AD-625 351 Fld. 5/3, 22/2, 17/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**ECONOMIC PROBLEMS OF ESTABLISHING A COMMUNICATIONS SATELLITE SYSTEM,**
by Leland L. Johnson. Oct 62, 10p. Rept. no. p-2647
Unclassified report

Prepared for testimony before the Subcommittee on Monopoly of the Senate Select Committee on Small Business, 3 Aug 61.

Descriptors: (*Communication satellites (Active), Economics), (*Economics, Communication satellites (Active)), Communication systems, United States Government, Industries, Commerce

Four types of monopolistic ownership for a U. S. Satellite System are considered: (1) system owned and operated exclusively by U. S. international common carriers; (2) system owned and operated by these carriers and satellite equipment manufacturers; (3) system owned by neither of these but by a diversity of stockholders who generally have no direct business ties in the communications field, this firm selling voice channels to the common carriers; and (4) a system owned and operated by the government that would sell channels to common carriers. The U. S. is stated to have the problem of deciding whether (1) to develop a system for a large number of countries, particularly underdeveloped ones, this probably including a large number of satellite ground stations in many smaller nations or (2) to establish relatively few large ground stations around the world in major population centers in order to tie together the major land masses and then connect the underdeveloped countries into the worldwide system by conventional land line.

**AD-625 050** **See Fld. 12/2**

## 5/5. HUMAN FACTORS ENGINEERING

**AD-625 117 Fld. 5/5, 19/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*HUMAN ENGINEERING LABS ABERDEEN PROVING GROUND MD*
**CROSS-COUNTRY SPEED AND DRIVER VIBRATIONAL ENVIRONMENT OF THE M60 MAIN BATTLE TANK,**
Technical memo.,
by Robert W. Fernstrom, Jr., Robert T. Gschwindand, and Gary L. Horley. Jul 65, 49p. Rept. no. TM-7-65
Unclassified report

Descriptors: (*Tanks (Combat vehicle), Human engineering), Performance (Engineering), Vibration, Velocity, Terrain, Accelerometers

This study investigated the g environment encountered by M60 tank drivers. It was conducted in two phases. In Phase I, the subjects drove an M60 tank over standard courses at constant speed. This phase examined the repeatability of measuring g loads when different drivers were subjected to the same environment. In Phase II, the subjects drove an M60 tank at maximum speed over two types of cross-country courses. This phase established a correlation between speed and g loads and determined the maximum g load the drivers would accept. (Author)

**AD-625 262 Fld. 5/5, 5/10, 13/10**
**CFSTI Prices: HC $4.00 MF $1.00**
*NAVY ELECTRONICS LAB SAN DIEGO CALIF*

**SPEECH INTERFERENCE ASPECTS OF NAVY NOISES. CALCULATIONS SHOW SPEECH INTERFERENCE MEASUREMENTS ARE SIMPLIFIED BY AVERAGING SOUND PRESSURE LEVELS IN MIDFREQUENCY OCTAVES.**
Research and development rept. for Jan 61-Dec 64,
by J. C. Webster, and R. G. Klumpp. 2 Sep 65, 146p. Rept. no. nel-1314
Proj. SF-013-11-01 Task 1357

Unclassified report

Descriptors: (*Noise, Naval equipment), (*Speech, Intelligibility), Social communication, Human engineering, Measurement, Auditory perception, Thresholds (Physiology); Hearing, Audiofrequency

Representative samples of ship, office, and shop noises were analyzed to determine simple methods for rating noise in shipboard spaces in relation to interference with speech communication. For simplicity in speech interference measurement, it is recommended that an average be taken of the octaves centered at 500, 1000, and 2000 cycles per second. (Author)

**AD-625 129** **See Fld. 5/9**

**AD-625 230** **See Fld. 17/8**

**AD-625 231** **See Fld. 17/8**

## 5/6. HUMANITIES

**AD-625 560** **See Fld. 12/1**

## 5/7. LINGUISTICS

**AD-625 005 Fld. 5/7, 9/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**NATURAL-LANGUAGE PROCESSING BY COMPUTERS-1966.**
Professional paper,
by R. F. Simmons. 1 Dec 65, 31p. Rept. no. sp-2279/000/00
Contract SD-97

Unclassified report

Descriptors: (*Computational linguistics, State-of-theart reviews), (*Language, Analysis), Computers, Counting methods, Information retrieval, Semantics, Syntax, Linguistics, Indexes, Machine translation

The eventual goal of language-processing research is the development of highly sophisticated question-answering systems. These would accept natural-language questions, search a multilingual library for pertinent factual text, translate and generate from that widely separated text essays that answered the question at any desired level of detail. Examples of existing question answerers, translations, essay writers, etc., are presented. These examples are evaluated as highly inventive linguistic gadgetry that is still far from practical usefulness. Linguistic, semantic, and psychological problems both of theory and practice must be solved before this gadgetry results in useful systems. Specific difficulties facing researchers in these areas are described. The paper concludes that the strongest existing machine capability with language is that of counting and indexing words of a text. This capability has already made the computer an indispensible partner in concordancing, information retrieval, linguistic analysis, and stylistic and context analysis. Although fascinating linguistic gadgetry is available on computers, the solid contribution so far lies in this well-developed capability of word counting and indexing. (Author) (For presentation at the Annual Meeting of the American Association for the Advancement of Science, Berkeley, Calif., Dec. 26-31, 1965)

**AD-624 938** **See Fld. 9/2**

**AD-624 939** **See Fld. 9/2**

**AD-624 940** **See Fld. 9/2**

**AD-625 303** **See Fld. 17/2**

**AD-625 403** **See Fld. 5/10**

**AD-625 409** **See Fld. 5/2**

## 5/8. MAN-MACHINE RELATIONS

**AD-625 567 Fld. 5/8, 9/2, 6/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**GRAPHICS.**
Semiannual technical summary rept. for 1 Jun-30 Nov 65,
by Jack I. Raffel. 30 Nov 65, 15p. Contract AF19 (628)-5167 ,ARPA Order-691 ESD TDR-65-561

Unclassified report

Descriptors: (*Graphics, Man-machine systems), (*Man-machine systems, Graphics), Display systems, Pattern recognition, Programming (Computers)

Recent efforts in the Graphics Program have concentrated on the development of a Graphical Service System, display routines compatible with the new timesharing system, APEX, and a universal translator, VITAL, which will be used to generate a graphical compiler. Programs for clipping and approximating conic segments have been developed and initial experiments which apply graphical techniques to procedure description have been attempted. (Author)

**AD-624 942** **See Fld. 5/9**

**AD-625 103** **See Fld. 5/10**

**AD-625 181** **See Fld. 9/2**

## 5/9. PERSONNEL SELECTION, TRAINING AND EVALUATION

**AD-624 937 Fld. 5/9, 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**COMPUTERS IN SYSTEMS OF HIGHER EDUCATION,**
by John G. Caffrey. 1 Dec 65, 14p. Rept. no. sp-2213

Unclassified report

Presented at the AEDS-Stanford Conference, October 31-November 3, 1965, at Stanford Univ.

Descriptors: (*Education, Computers), (*Computers, Education), Data processing systems, Universities, Management engineering, Personnel, Training

Designing an information system requires that the administrator think carefully and make very explicit his objectives and criteria, and some observers feel that such an imperative is a useful discipline in its own right. As the need for regional and interinstitutional use of computer and information systems increases, new arrangements will be needed for cooperation, both vertically and horizontally, among and between institutions and their governing or regulatory boards. Steps will have to be taken to provide training and orientation for all levels of management in higher education, especially in the training of novice administrators who will manage tomorrow's systems of higher education. Using the existing technology (not all of it as yet widely disseminated or well understood), it is possible to draw a picture of the university of tomorrow in which the computer, with its attendant peripheral equipment and software systems, will be a basic and indispensable part of the fabric of management as well as of the total operating and instructional program of the institution. The main problem at the moment is not the technology, which has outpaced its users in higher education, but dissemination, development, and the training of appropriate personnel. (Author)

**AD-624 941 Fld. 5/9, 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**COMPUTER SIMULATION OF ROLE CONFLICT RESOLUTION,**
by John T. Gullahorn, and Jeanne E. Gullahorn.
9 Nov 65, 22p. Rept. no. sp-2261/000/00

Unclassified report

Revised version of a paper presented at the meetings of the American Sociological Association, Chicago, Illinois, September 2, 1965.

Descriptors: (*Personnel management, Decision making), (*Computers, Personnel management), Simulation, Social communication

The paper reports progress on computer simulations of role conflict using HOMUNCULUS, an operating computer model based on George Homans' theory of elementary social behavior. The role conflict data selected for simulation come from the senior author's questionnaire study of the impact of personal preference and reference-group pressures on decisions concerning role performance. Simulations of three role conflict situations are described, and computer-generated data are compared with actual responses of survey participants. The results demonstrate that through computer simulation it is possible to represent and to test alternative theoretical formulations and to choose the one producing data best approximating findings from living subjects. Since the simulated responses follow as direct consequences of the information-processing routines that operationally express the hypotheses, these data involve no extraneous, implicit influences. (Author)

**AD-624 942 Fld. 5/9, 5/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**THE DESIGN OF MAN-MACHINE SYSTEMS IN EDUCATION.**
Professional paper,
by John F. Cogswell. 10 Nov 65, 12p. Rept. no. sp-1856/000/01

Unclassified report

Descriptors: (*Man-machine systems, Education), (*Education, Man-machine systems), Design, Data processing systems, Personnel management

Educational systems cannot exploit the potentials of current technology unless problems are approached from a task-oriented point of view instead of the more traditional personnel-centered one. Moreover, the approach should stress an integrated man-machine system concept. The paper describes the above concepts, with particular reference to the functions of counseling, educational planning, and consultation to teachers. (Author)

**AD-625 004 Fld. 5/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**DECISION THEORY AS APPLIED TO PERSONNEL CLASSIFICATION AND EVALUATION.**
Professional paper,
by John M. Leiman. 25 Oct 65, 23p. Rept. no. sp-2234

Unclassified report

Descriptors: (*Decision theory, Personnel management), (*Personnel management, Decision theory), Selection, Classification, Probability, Minimax technique

The paper includes: (1) a brief introduction to decision theory; (2) a discussion of some aspects of personnel management; and (3) a discussion of some ways that decision theory may be used to improve some of the current practices in personnel management. (Author)

**AD-625 119 Fld. 5/9, 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF*
**THE VALIDITY OF THE ADVANCED TECHNICIANS TEST IN PREDICTING PERFORMANCE AT CLASS 'B' AND 'C' SCHOOLS.**
Technical bull.,
by Patricia J. Thomas, and Edmund D. Thomas.
Dec 65, 30p. Rept. no. stb-66-15
Proj. PF016050302
Unclassified report

Descriptors: (*Naval personnel, Selection), (*Psychometrics, Naval personnel), Classification, Tests, Performance (Human), Naval training, Correlation techniques, Tables

The purpose of this research was to evaluate the Advanced Technicians Test (ATT) and several other selection devices for assigning career petty officers to advanced technical training. The ATT, Verbal Analogies Test, and Mechanical Test X-3 were administered experimentally to 1089 students attending twelve Class 'B' and 'C' service schools. Basic Test Battery scores, length of time in the service, and rate were used, along with the experimental tests, for predicting Final School Grade. Zero-order and multiple correlational analyses determined that all of the experimental tests were highly valid predictors of school grade. Operational use of the ATT in selection for advanced technical training is recommended, with minimal modifications in subtest content for various schools. (Author)

**AD-625 129 Fld. 5/9, 5/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*DUNLAP AND ASSOCIATES INC WASHINGTON D C*
**RESEARCH ON CONSIDERATION OF TRAINING FUNCTIONS DURING DESIGN OF OPERATIONAL EQUIPMENT.**
Final rept.,
by J. M. Gradijan, R. Gebhard, and F. A. Brooks.
9 Jul 65, 63p. Contract N61339-1450 Proj. 7675 NAVTRADEVCEN 1450-1
Unclassified report

Descriptors: (*Training devices, Human engineering), (*Weapon systems, Training devices), Military training, Performance (Human), Military personnel, Cost effectiveness, Design, Simulation, Feasibility studies

Based primarily upon experiences of designers and users, the feasibility of integrating means for training into operational military systems was determined. A technique was developed for determining the feasibility of incorporating training provisions in a new design which involves interaction between the 'Training Expert,' the 'Training Device Designer,' and the 'Equipment Designer.' (Author)

**AD-625 192 Fld. 5/9, 15/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PROTECTION FROM MASS-DESTRUCTION WEAPONS,**
by N. Ivanshentsev, and V. Mesterov. 26 Oct 65, 18p. Rept. no. ftd-TT-65-688
TT 66-60032
Unclassified report

Unedited rough draft trans. of Voennyi Vestnik (USSR) n11 p56-61 1964. Supersedes trans. dated 2 Jul 65.

Descriptors: (*Military training, Mass destruction weapons), (*Mass destruction weapons, Defense systems), Training films, Nuclear physics, Nuclear weapons, Radiological contamination, Decontamination, Biological warfare agents, Chemical warfare agents, Protective masks, Safety devices, USSR

Information on mass-destruction weapons, skilled experience in dealing with their use by the enemy, and protection from them is acquired in all combat training and primarily during studies on the subject of 'mass-destruction weapons and protection from them'. This subject is now considered one of the most important for all types of forces and includes such themes as basic nuclear physics; nuclear, chemical and bacteriological weapons of the enemy; individual means of protection, first aid practices while under attack; equipment for decontamination; and disinfection; partial and total special preparation. Successful mastery of this material is possible only if study is carried out not only by officer-chemists but also by unit and subunit commanders and staff officers.

**AD-625 222 Fld. 5/9, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C*
**FACTORING TO FIT OFF DIAGONALS.**
Technical research note,
by Robert F. Boldt. Oct 65, 23p. Rept. no. trn-161
Proj. DA 2T013001A708
Unclassified report

Descriptors: (*Factor analysis, Matrix algebra), Optimization, Least squares method, S-matrix, Psychometrics, Anthropometry

In factoring for conventional purposes, factor loadings are desired which minimize the sums of squares of offdiagonal residuals. Such loadings have been shown to be consistent estimates of the population factor loadings. Two methods are developed: a generalization of the method of minimum residuals, and an application of the method of steepest descent. The method of steepest descent is superior since it is faster, it gave the right communalities when the communalities were known, and it cannot give imaginery factors. Communalities increase as the number of factors increase--Heywood cases imply an upper bound on the number of factors. When applied to somatotype data, the method improved substantially on centroid solutions and indicated a reinterpretation of earlier factoring studies. (Author)

**AD-625 223 Fld. 5/9, 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C*
**TIMELINESS AND ACCURACY IN A SEQUENTIAL DECISION MAKING TASK.**
Technical research note,
by Charles H. Hammer. Oct 65, 34p. Rept. no. trn-162
Proj. DA-2J024701A723
Unclassified report

Descriptors: (*Decision making, Sequential analysis), (*Sequential analysis, Decision making), Decision theory, Analysis of variance, Psychometrics, Performance (Human), Command + control systems

One objective of the COMMAND SYSTEMS Task is to provide research information by which decision making and information assimilation from displays may be facilitated. The present publication reports on an experiment conducted to investigate the amount of intelligence information which decision makers judge sufficient for action and to relate these judgments to the accuracy and timeliness of the decisions made. In a series of simulated military situations involving threat evaluation, three practice problems and nine experimental problems were generated. Slides showing 4, 6, or 8 successive aggressor force moves toward three friendly units were shown to 60 enlisted men each of whom was required to give an interim judgment as well as a final decision as to enemy attack intent. Analysis of results showed large individual differences in judgments of confidence and sufficiency. Tendency to judge information insufficient for taking action was significantly greater when lesser amounts of information were provided. For final decisions, as more information was provided, accuracy of performance increased from 46% to 81% and judgments of confidence increased from 52% to 68%. Findings strongly suggest that along with techniques to enhance the accuracy of decisions, effective techniques are needed to enhance confidence in those decisions therby increasing timeliness with which accurate decisions are reached. (Author)

**AD-625 224 Fld. 5/9, 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C*
**OPTIMAL ALLOCATION OF ENLISTED MEN; FULL REGRESSION EQUATIONS VS. APTITUDE AREA SCORES.**
Technical research note,
by Richard C. Sorenson. Nov 65, 28p. Rept. no. trn-163
Proj. DA-2J024701A722
Unclassified report

Descriptors: (*Personnel management, Optimization), (*Aptitude tests, Personnel management), Statistical analysis, Manpower studies, Performance (Human), Least squares method

The Manpower Information and Computerized Systems Task utilizes the growing body of psychological, mathematical, and computer technology in seeking solutions to manpower management problems. The present Technical Research Note reports on continuing research directed toward increasing the efficiency of allocation through use of the Army Classification Battery (ACB) test scores. The research using a simulation technique evaluates the loss in performance efficiency attributable to the use of the two variable composites--Aptitude Areas--rather than the superior eleven variable regression estimate. It was found that in an optimal allocation procedure, performance of enlisted men could be substantially increased by using regression estimates from all ACB tests rather than the two test composites. (Author)

**AD-625 378 Fld. 5/9, 15/7**
**CFSTI Prices: HC $2.00 MF $0.75**
*DUNLAP AND ASSOCIATES INC DARIEN CONN*
**SYSTEMS ANALYSIS OF AAW TRAINING REQUIREMENTS.**
Technical rept.,
by Gabriel G. Jeantheau, Birger G. Andersen, and Kenneth W. Yarnold. Nov 65, 80p. Contract N61339-1574 Proj. 7596 Task 75962
NAVTRADEVCEN 1574-1
Unclassified report

Descriptors: (*Naval training, Operations research), (*Antiaircraft defense systems, Operations research), Cost effectiveness, Effectiveness, Performance tests, Systems engineering, Teaching methods

The Training Analysis Procedure (TAP) is a technique for identifying areas in system operations which provide greatest payoff in system effectiveness through training. The purpose of the study was to apply the TAP to the Navy's AAW system. This application examined two levels of operator performance in AAW systems as a function of method of training and time-to-train. The relative benefits to system performance of training various task groups via different training methods are shown. The results indicate that, for the levels analyzed, combined shipboard training for subsystem groups will achieve the greatest payoff in system effectiveness. Findings are cited concerning needs in existing shipboard simulation utilization and additional shipboard training equipment. Recom-

mendations are made for further research to develop information about operator performance for different AAW system states, for research in optimum team organization, and for research to examine the need for and requirements for generalized radar training. (Author)

AD-625 041 See Fld. 5/10

AD-625 284 See Fld. 1/2

## 5/10. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

**AD-624 900 Fld. 5/10**
**CFSTI Prices: HC $3.00 MF $0.50**
*ILLINOIS UNIV URBANA DEPT OF PSYCHOLOGY*
**BINOCULAR RIVALRY: INDIVIDUAL DIFFERENCES IN ITS FUNCTIONAL RELATIONSHIP TO LUMINANCE AND INSTRUCTIONAL CONDITIONS.**
Technical rept.,
by Connie Wong Meredith. Sep 65, 51p. Contract Nonr-1834 (39)
Unclassified report

Descriptors: (*Vision, Psychophysiology), Luminescence, Color vision, Retina, Conditioned reflex, Nervous system, Physiology, Factor analysis, Analysis of variance, Mathematical models, Tables

Thirty male and thirty female Ss experienced the binocular rivalry phenomenon by viewing stimuli in a modified Wheatstone stereoscope. Principal axis factor analysis indicated that binocular rivalry rate is a single-factor function of the two independent variables, luminance and instructional conditions. An analysis of variance indicated that the effects of both independent variables were significant but that there was no significant interaction. The results were discussed with respect to an S-R model and a neurophysiological model. (Author)

**AD-624 901 Fld. 5/10**
**CFSTI Prices: HC $5.00 MF $1.00**
*ILLINOIS UNIV URBANA DEPT OF PSYCHOLOGY*
**A MODEL FOR THE GENERALIZABILITY OF TESTS CONSTRUCTED BY STRATIFIED SAMPLING.**
Technical rept. (Doctoral thesis),
by Douglas McKie. Sep 65, 156p. Contract Nonr-1834 (39)
Unclassified report

Descriptors: (*Mathematical models, Psychometrics), (*Psychometrics, Mathematical models), Reliability, Factor analysis, Correlation techniques, Sampling

A mathematical model is constructed to investigate the generalizability of tests considered to be constructed by sampling from a stratified universe of items. Items are not assumed to be equivalent, nor test-forms paralled. The basic assumptions are those of Rajaratnam, Cronbach, and Gleser; but though the mathematical development is quite different, the model generates generalizability coefficients whose estimates from test data are precisely those of Rajaratnam et al. They are stratified variants of the Kuder and Richardson formulas 20 and 21. Order relations among them are derived, and certain of their properties are investigated. Predictions from the model are shown to have empirical support. The study thus confirms the results of Rajaratnam et al., and sheds additional light on the behavior of the generalizability coefficients discussed by them. (Author)

**AD-624 918 Fld. 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*TEACHERS COLL COLUMBIA UNIV NEW YORK*
**CONFLICT AND ITS RESOLUTION.**
Technical rept.,
by Morton Deutsch. 1 Oct 65, 47p. Rept. no. tr-1
Contract Nonr-4294 (00) Grant NSF-GS-302
Unclassified report

Presented 5 Sep 65 at the meetings of the American Psychological Association.

Descriptors: (*Decision making, Analysis), (*Problem solving, Analysis), Attitudes, Group dynamics

Circumstances are described in which conflict resolution is likely to occur.

**AD-624 919 Fld. 5/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*TEACHERS COLL COLUMBIA UNIV NEW YORK*
**THE EFFECT OF ROLE-REVERSAL DURING THE DISCUSSION OF OPPOSING VIEWPOINTS.**
Technical rept.,
by Barbara F. Muney. 1 Nov 65, 70p. Contract Nonr-4294 (00)
Unclassified report

Rept. on Techniques of Inducing Cooperation Between Adversaries.

Descriptors: (*Attitudes, Verbal behavior), (*Verbal behavior, Attitudes), Social psychology, Social communication, Behavior, Performance (Human), Analysis of variance, Tables

The study examined the effects of two different discussion methods, role-reversal and direct presentation of one's own viewpoint, upon the ease of reaching agreement and upon attitudinal change. Pairs of subjects, who had been selected for their extreme and opposed attitudes on a controversial issue, were instructed to attempt to reach a joint solution on the issue after an initial period of either role-reversal or self-exposition. Role-reversal proved no more effective than self-exposition in inducing attitudinal change or overcoming the conflict. Both methods produced considerable understanding of the other's views and attitude change towards them. Both own and other's skill in role-reversal fostered attitude change towards the other, mutual respect, and mutual understanding. (Author)

**AD-624 920 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*TEACHERS COLL COLUMBIA UNIV NEW YORK*
**REWARD STRUCTURE AND INFORMATION IN THE DEVELOPMENT OF COOPERATION IN TWO-PERSON, TWO-CHOICE GAMES.**
Technical rept. on Techniques of Inducing Cooperation Between Adversaries,
by William P. Smith. 15 Nov 65, 20p. Rept. no. tr-3
Contract Nonr-4294 (00)
Unclassified report

Descriptors: (*Behavior, Social psychology), (*Social psychology, Bargaining), Game theory, Reaction (Psychology), Learning, Performance.(Human), Probability, Analysis of variance

The study investigated the development of cooperation in three types of matrix games: a bargaining game, a trust game (a Prisoner's Dilemma Game), and a mixed game (in which the incentives to cooperate and to compete are equated). In addition, the effects of four levels of information were investigated in each type of game. The four levels were: (1) Minimal (non-social). Players were told simply that they must, on each trial, select one of two possible responses and they would then receive a score. They were told they were working on a problem or puzzle with solutions, not a game of chance. They were given no indication that another player was involved and that the other player's choice could affect his outcomes. (2) Own Payoff known (non-social). This condition is identical with the one just described except that the player was told the two possible outcomes that were associated with each of the two choices available to him. (3) Other's presence known. The only difference between (2) and (3) is that here each player is informed that the particular score he receives of the two possible ones for each of his possible responses is determined by the behavior of another player. (4) Full information. Here each player is shown the full matrix and the consequences of each response combination are explained in detail. Subjects played one or another of the three games, in one or another of the information conditions, for 100 trials with another real subject. That is, whether or not the subject knew that the game involved another player, his outcomes were determined in part by another subject with whom he was paired. (Author)

**AD-624 921 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*TEACHERS COLL COLUMBIA UNIV NEW YORK*
**TECHNIQUES OF INDUCING COOPERATION BETWEEN ADVERSARIES.**
Annual status rept. for 1 Oct 65,
by Morton Deutsch. 1965, 25p. Contract Nonr-4294 (00)
Unclassified report

Descriptors: (*Behavior, Social psychology), (*Attitudes, Verbal behavior), (*Social psychology, Bargaining), Social communications, Game theory, Reaction (Psychology), Performance (Human), Learning, Hypnosis, Statistical analysis

Summaries are given of reports on the following: (1) Effects of role-reversal during the discussion of opposing viewpoints (AD-624 919); (2) Prisoner's dilemma studies; (3) Conflict and its resolution: a theoretical analysis; (4) Reward structure and information in the development of cooperation in two-person, two-choice games (AD-624 920); (5) Competitive relationship between hypnotists; (6) Use of role-reversal in intergroup competition; (7) Further research with the prisoner's dilemma.

**AD-624 992 Fld. 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**A PERSONALITY/ATTITUDE SCHEDULE FOR USE IN EXPERIMENTAL BARGAINING STUDIES.**
Technical memo.,
by Gerald H. Shure, and Robert J. Meeker. 13 Jul 65, 34p. Rept. no. tm-2543
Contract SD-286
Unclassified report

Descriptors: (*Bargaining, Social psychology), (*Psychometrics, Bargaining), (*Personality, Bargaining), (*Attitudes, Bargaining), Behavior, Statistical analysis, Factor analysis, Statistical data, Tables

The paper describes the steps used in developing a set of scales to evaluate the effects of individual differences on bargaining behavior. It presents a description of the six scales in the schedule, together with descriptive statistical data and norms for the scales, and gives procedures for administering and scoring the scales. A copy of the currently used form of the schedule is included in the appendix. (Author)

**AD-625 019 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*COLORADO UNIV BOULDER*
**A COGNITIVE DETERMINANT OF IMPRESSION FORMATION.**
Technical rept.,
by Robert Ware, and O. J. Harvey. 1965, 21p.

Rept. no. tr-17
Contract Nonr-1147 (07) Proj. NR-178-450
Unclassified report

Descriptors: (*Personality, Perception (Psychology)), (*Attitudes, Personality), Social psychology, Reaction (Psychology), Behavior, Statistical analysis

Concrete functioning individuals were shown to generalize in their impressions further than abstract functioning individuals at both higher and lower levels of informational input when the input was hedonically consistent with the direction of inference. Concrete functioning individuals generalized less than abstract functioning individuals, however, when the input information was hedonically inconsistent with the direction of inference. These findings may be interpreted as supporting the notion that concrete persons, more than abstract individuals, are disposed toward seeing the 'good' person as all good and the 'bad' person as all bad, minimizing the plausibility that the same person could simultaneously possess both good and bad characteristics. The findings thus point to concrete-abstract functioning as a variable of considerable weight in the extent of inferences people make of others. (Author)

**AD-625 022 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*EMORY UNIV ATLANTA GA*
**CHANGES IN THE JUDGMENTS OF SENSITIZERS AND REPRESSERS IN RESPONSE TO FAILURE AND SUCCESS EVALUATIONS OF GROUP PERFORMANCE,**
by Arthur M. Cohen, and Richard N. Carrera. 1965, 20p. Contract Nonr-4252 (01) ,NSF-GS-501
Unclassified report

Descriptors: (*Group dynamics, Psychometrics), (*Personality, Analysis), (*Anxiety, Reaction (Psychology)), Defense mechanisms (Psychology), Performance (Human), Analysis of variance, Decision making, Attitudes

The study was intended to test hypotheses concerning the differential responses of sensitizers (those subjects utilizing primarily approaching responses to anxiety) and repressers (those subjects utilizing primarily avoiding responses to anxiety) to authoritative evaluations of group performance. Four five-man groups of sensitizers and four groups of repressers were assigned to each of the following experimental conditions: failure, success and neutrality. These conditions were evaluations of group performances that had taken place in immediately preceding problem-solving, non-face-to-face activities. Before and after measures were obtained of subjects' judgments of their actual fastest and slowest times and their ideal fastest and slowest times. The major conclusion drawn from this experiment was that group factors may constitute a set of mitigating conditions that intervene between the presence of stimuli and their effects on the manifest productions of personality. Group factors were believed to have operated in our experiment in two ways: first, via the task of making judgments of group performance, and second, via the anxiety-reducing presence of similar others in a group context when confronted with social evaluation.

**AD-625 041 Fld. 5/10, 5/9**
**CFSTI Prices: HC $6.00 MF $1.25**
*DUNLAP AND ASSOCIATES INC DARIEN CONN*
**CONCEPTS AND PRACTICES IN THE ASSESSMENT OF HUMAN PERFORMANCE IN AIR FORCE SYSTEMS.**
Final rept. Sep 64-Apr 65,
by James J. Keenan, Treadway C. Parker, and Henry P. Lenzycki. Sep 65, 202p. Rept. no. ssd-65-172 (514)R
Contract AF33 (615)-1754 Proj. AF-1710 Task 171006
AMRL TR-65-168
Unclassified report

Descriptors: (*Air force personnel, Performance tests), (*Performance tests, Effectiveness), Systems engineering, Standards, Human engineering, Performance (Human), Psychometrics

The report describes the current practices and evaluative aspects of human performance assessment in Air Force Systems. The human performance test programs for thirty-four systems and subsystems representing the major types of systems (aeronautical, electronic, missile, and space) used by the Air Force are reviewed. For these systems, the major functional areas covered include: (1) Air Force policies, directives, requirements, and constraints concerning the development and assessment of system tests and human performance; (2) the behavioral sciences approach to, and technology for, assessing human performance; and (3) Air Force practices in assessment of human performance. Throughout, the systems context, within which human performance is conceived and evaluated, is emphasized. Consequently, the techniques within the behavioral sciences for examining human performance conceptually and empirically in the system test environment is a particularly practicable part of the report. The report is supported by many tables and charts, excerpts from test directives pertinent to human performance assessment, and approximately 600 categorized references. (Author)

**AD-625 102 Fld. 5/10**
*DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)*
**BAR PRESSING BY THE RAT AS A FUNCTION OF AUDITORY STIMULATION,**
Research paper,
by J. J. Lavery, and P. J. Foley. 1963, 2p. Rept. no. rp-583
Proj. PCC-D50-89-01-01
Unclassified report

*Availability: Published in Psychonomic Science, v3 p199-200 1965. Copies to DDC users only.*

Descriptors: (*Auditory perception, Conditioned reflex), (*Conditioned reflex, Noise), Rats, Canada, Stimulation, Functional analysis

The experiment shows the rate of bar pressing by the rat as a function of four ambient white noise levels, when a bar press interrupts the noise for 15 sec. The results indicate an inverted U-shaped relation at the beginning of the experiment. As successive exposures to white noise take place, the relation changes progressively to a linear one. These findings support the sensory reinforcement hypothesis, and are discussed in relation to an a priori distinction between stimulus and drive. It is suggested that the same state may serve as both. (Author)

**AD-625 103 Fld. 5/10, 5/8**
*DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)*
**PROBABILITY LEARNING IN STEP-INPUT TRACKING.**
Research paper,
by C. B. Gibbs. 31 Jul 64, 10p. Rept. no. drmlrp-541
Proj. DRML-D77-94-20-23
Unclassified report

*Availability: Published in Brit. J. Psychol v56 n2-3 p233/42 1965. Copies to DDC users only.*

Descriptors: (*Tracking, Learning), (*Learning, Probability), Conditioned reflex, Errors, Proprioception, Man-machine systems, Human engineering, Motor reactions, Canada

Six men and six women tracked stimuli that demanded responses of unequal probability. The control-display relation was directionally incompatible. Half the subjects used their non-preferred hand. Many large directional errors occurred in early practice and these were amended after a mean delay of 0.24 sec. With continued practice, small errors persisted mainly in responses of low probability but the mean amendment time fell to 0.11 sec. These errors proveded new, highly sensitive measures that revealed differences in performance associated with sex, hand preference and probability ($P < 0.01$). The results are compatible with hypotheses that the speed, direction and extent of movement are determined by negative proprioceptive feedback and integral-error control. (Author)

**AD-625 106 Fld. 5/10**
*MCGILL UNIV MONTREAL (QUEBEC)*
**THE MANIPULATION OF STRATEGIES OF REPORT IN DICHOTIC LISTENING,**
by M. P. Bryden. 14 Nov 63, 14p. Contract DRB-9401-11
Unclassified report

*Availability: Published in Canad. J. Psychol. Rev. Canad. Psychol., v18 n2 p126-38 1964. Copies to DDC users only.*

Descriptors: (*Hearing, Recall), (*Recall, Word association), Verbal behavior, Memory, Canada

Three experiments on dichotic listening, using a free recall procedure, were carried out. The first experiment demonstrated that much the same strategies of report are used with words and with numbers. The second experiment indicated that verbal associations between the various elements in the series can influence the recall strategy, while the final experiment showed that the use of the same number on both channels at the same time can lead to a shift from one channel to the other. The experiments provide support for a fading-trace theory of immediate memory, but fail to provide any conclusive evidence to support a concept of switching time. It is suggested that the organization of a set of simultaneously available stimulus traces may be viewed as a retrieval process dependent upon the spatial, tempral, and associative relations between the traces. (Author)

**AD-625 107 Fld. 5/10**
*MCGILL UNIV MONTREAL (QUEBEC)*
**SPATIAL ORGANIZATION OF CHILDREN'S RESPONSES TO A PICTORIAL DISPLAY,**
by Judith Gottschalk, M. P. Bryden, and M. Sam Rabinovitch. 1964, 5p. Contract DRB-9401-11, PHS-M-2455
Unclassified report

*Availability: Published in Child Development v35 p811-5 1964. Copies to DDC users only.*

Descriptors: (*Children, Perception (Psychology)), (*Reading, Children), Learning, Reaction (Psychology), Psychometrics, Performance (Human), Behavior, Canada

Ability to organize responses systematically to a spatial stimulus array seems important for many forms of complex behavior. Children between the ages of three and six were asked to name all the objects on two forms of a pictorial display, and were retested two weeks later. The response sequences were scored on the basis of spatial proximity of successive pairs. The results clearly indicate developmental changes in response organization that cannot be due solely to increasing familiarity with written materials. The implications are discussed in terms of the role of past experience. (Author)

**AD-625 109 Fld. 5/10**
*WESTERN AUSTRALIA UNIV PERTH*
**THE PLACE OF SUBJECTIVE EXPERIENCE IN CONTEMPORARY PSYCHOLOGY.**
by Alan Richardson. 15 Jun 64, 10p.
Unclassified report

*Availability: Published in Brit. J. Psychol. v56 n2/3 p223-32 1965. Copies to DDC users only.*

Descriptors: (*Psychology, Experimental data), (*Experimental data, Psychology), Theory, Behavior, Psychometrics

This paper discusses some problems raised by Koch (1958) concerning the role of experiential analysis in contemporary psychology. More specifically the attempt is made to distinguish the concept of experience from the concept of behaviour and to justify the use of subjective report on both logical and empirical grounds. The problem of developing more accurate categories for self-observation and of developing valid constructs from self reports is considered. The final section of the paper is concerned with the theoretical implications of the experientially derived construct of imaging ability and of the subjective activity of mental practice. (Author)

**AD-625 130 Fld. 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y*
**BIOPOTENTIAL SIGNALS AS A FUNCTION OF LEARNING TASK DIFFICULTY.**
Technical rept.,
by John L. Andreassi, and John D. Cavallari. 19 Aug 65, 35p. Rept. no. navtradevcen-IH-34
Proj. 7885 Task 78857

Unclassified report

Descriptors: (*Learning, Electrophysiology), Galvanic skin response, Pulse rate, Muscles, Reflexes, Reaction (Psychology), Stress (Psychology), Relaxation (Physiology), Motivation, Tracking, Performance (Human), Word association, Naval personnel, Students, Education, Aging (Physiology)

The present study is concerned with biopotential responses to a learning situation in which the difficulty of materials was systematically varied. In Experiment I, eight Navy enlisted men learned three lists of nonsense syllables (0%, 53% and 100% association value), while heart rate (HR), palmar skin conductance (PSC), galvanic skin responses (GSRs), and muscle action potentials (MAPs) were monitored continuously. Subjects reported for one-hour sessions on each of three successive days. Resting levels of all biopotential signals were taken at regular intervals in each of the experimental sessions. Experiment II was conducted in the same manner with eight college students as subjects. The results showed that: (1) there were definite and large increases in all of the biopotential signals during learning as compared to the resting conditions, (2) the Navy men had significant increases in both PSC and HR with the easy and moderate lists as compared with the most difficult list, (3) the college students had non-significant increases in HR as a function of ease of list. The results for the Navy subjects were interpreted in terms of motivational factors. It was suggested that the discrepancy in results for the two groups may have been due to educational and age factors. (Author)

**AD-625 217 Fld. 5/10, 8/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*PURDUE UNIV LAFAYETTE IND*
**INVESTIGATION OF FUSION AND FIXATION DISPARITY LIMITS FOR PHOTOGRAMMETRY.**
Final technical rept., Jul 64-Aug 65,
by Sandor A. Veres. Aug 65, 46p. Contract DA-44-009-AMC-641 (X) Proj. DA 4A-011001B-350

Unclassified report

Descriptors: (*Photogrammetry, Space perception), (*Space perception, Photogrammetry), Visual perception, Stereoscopic display systems, Optical equipment, Psychomotor tests

Fixation disparity is a phenomenon associated with normal binocular vision which causes an observer to perceive a fixated point in space in front of or behind its actual location in physical space. Considering the floating mark settings which are fundamental to photogrammetric measurements, any such settings made by an observer when fixation disparity is present will contain errors of a constant nature which will vary with the viewing conditions and with time. Previous studies of the phenomenon have been of a basic nature and, in general, have not been directly related to the needs of photogrammetry. It is the purpose of this project, therefore, to investigate the effects of fixation disparity on floating mark measurements made under photogrammetric conditions using variable measuring marks, variable targets and variable backgrounds.

**AD-625 280 Fld. 5/10**
*DUKE UNIV DURHAM N C*
**SOME PERSONAL AND SITUATIONAL FACTORS RELEVANT TO THE CONSISTENCY AND PREDICTION OF CONFORMING BEHAVIOR,**
by Kurt W. Back, and Keith E. Davis. 1965, 14p. Contract Nonr-1181 (11) Grant ,PHS-6N-6912 Proj. NR-177-470

Unclassified report

Prepared in cooperation with Colorado Univ., Boulder.

*Availability: Published in Sociometry v28 n3 p227-40 Sep 1965. Copies to DDC users.*

Descriptors: (*Behavior, Group dynamics), (*Group dynamics, Behavior), Perception (Psychology), Social psychology, Personality, Stress (Psychology), Attitudes, Sociometrics

The consistency of individual conformity to group pressure was investigated in three quite different situations--a perceptual judgment task, self-reported acceptance of peer group norms, and self-reported acceptance of authority pressures. There was a small but consistent trend for persons who conformed in one situation to conform in other two. Elaine G. Sofer's scale of Inner-vs. Other-directedness was highly related to conformity in two of the three situations. Status in the peer group was negatively related to conformity in two of the three situations when a competence criterion of status was employed but not when a popularity criterion was used. A measure of socially desirable responding predicted to judgmental yielding when the source was an attractive peer; in the same situation, importance of the task was negatively related to yielding. (Author)

**AD-625 283 Fld. 5/10**
*CALIFORNIA UNIV BERKELEY*
**UNLEARNING UNDER CONDITIONS OF SUCCESSIVE INTERPOLATION,**
by Leo Postman. 21 May 64, 9p. Contract Nonr-222 (90)

Unclassified report

*Availability: Published in Journal of Experimental Psychology v70 n3 p237-45 1965. Copies to DDC users only.*

Descriptors: (*Learning, Word association), Reaction (Psychology), Retention, Recall, Conditioned reflex, Verbal behavior, Errors

The study investigates unlearning of 1st-list associations as a function of the number of different new responses attached to the original stimuli during a fixed period of interpolated learning. In an RI design the work groups received 16 interpolated trials which were distributed over 1, 2, or 4 different lists. Retention was measured by unpaced free recall and by S-R matching. By both measures RI increased with the number of interpolated lists. The results support the conclusion that the frequency of unreinforced evocations of original responses, and hence the amount of unlearning, vary inversely with the degree of dominance attained by the interpolated habits. (Author)

**AD-625 324 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT*
**RESPONSE DURATION AND INTERRESPONSE TIME UNDER FR5 AND VR5 SCHEDULES AND SUBSEQUENT EXTINCTION,**
by Robert M. Herrick. 8 Nov 65, 19p. Rept. no. nadc-MR-6505
NAVMED MR005.13-0002.16-15

Unclassified report

Descriptors: (*Behavior, Conditioned reflex), (*Conditioned reflex, Learning), Reaction (Psychology), Reflexes, Rats

With respect to press duration, t, and interresponse time, i, rats under FR5 and VR5 schedules and subsequent extinction behaved similarly. During acquisition days, mean t and mean i decreased, and mean response rate increased. Compared with acquisition, in extinction (a) the relative frequency of short t's decreased, (b) either the relative frequency of short is decreased or the relative frequencies of both short and long is increased. Variations in several central tendency and variability measures of t and i within the first extinction day were greater than variations within the last acquisition day. Median duration of the first press or of the first interresponse time following water-dipper operation was relatively long ('postreinforcement pause'). Thereafter, both median t and median i, as function of ordinal number following dipper operation, tended to remain relatively constant. Within an FR5 or VR5 cycle, response rate changed abruptly from zero to a constant rate. During extinction, periods of responding at a normal or slightly subnormal rate alternated with periods of little or no responding. (Author)

**AD-625 387 Fld. 5/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*ILLINOIS UNIV URBANA DEPT OF PSYCHOLOGY*
**ROLE ASSIGNMENT AND ATTITUDINAL COMMITMENT AS FACTORS IN NEGOTIATION.**
Technical rept.,
by Neil J. Vidmar, and Joseph E. McGrath. Aug 65, 85p. Rept. no. TR-3
Contract AF49 (638)-1291 Proj. AF-9779 Task 977902
AFOSR 65-1557

Unclassified report

Descriptors: (*Social psychology, Decision making), Social communication, Attitudes, Group dynamics, Applied psychology

This study investigated the effects of role assignment and attitudinal commitment on task performance and attitudes in negotiation groups. Negotiation groups were studied in a laboratory situation using subjects from real reference groups negotiating on a meaningful subject. The findings fall into two main categories: (2) Negotiation groups composed of two members from one reference group, with one negotiator having a cross-role assignment, were able to set forth more impartial solutions than standard negotiation groups composed of members representing their own reference groups. (2) Within a standard negotiation group the less committed the negotiators were to their respective reference groups, the better the group performed. (Author)

**AD-625 403 Fld. 5/10, 5/7**
**CFSTI Prices: HC $4.00 MF $0.75**
*PRINCETON UNIV N J*
**A DEVELOPMENTAL STUDY OF THE SEMANTIC DIFFERENTIAL.**
Research bulletin,
by Roy S. Lilly. Aug 65, 102p. Rept. no. rb-65-28
Contract Nonr-1858 (15) ,Nonr-2214 (00) Proj. NR-150-088 ,NR-151-174

Unclassified report

Descriptors: (*Word association, Semantics), (*Semantics, Word association), Factor analysis, Vocabulary, Children, Test methods, Test construction (Psychology), Statistical analysis, Adults

The large literature on Osgood's Semantic Differential (S) (Osgood, C. E., G. J. Suci and P. H. Tannenbauna. 'The measurement of meaning.' Urbana, Univ. Illinois press, 1957) suggests that for adults there are three major dimensions in the domain of effective meaning--evaluation, potency, and activity. The main purpose of the present study was to explore the changes in the dimensions of affective meaning as a function of age. A second purpose was to obtain test-retest reliabilities of the SD for children. The typical SD study involves having subjects rate a number of concepts (e.g., Mother) on a series of bipolar adjective scales (e.g., good-bad). In the present study, the same 20 concepts (and two repeats) were rated on the same 28, 11-point adjective scales by 96, 110, 107, and 100 parochial school children in grades three, four, six, and in high school. Both the adjectives and concepts were high frequency words. It was concluded that the primary dimensions of affective meaning for children as yound as grade three children were very similar to those for adults.

**AD-625 422 Fld. 5/10, 5/11, 6/16**
**CFSTI Prices: HC $2.00 MF $0.50**
*DUKE UNIV DURHAM N C*
**BASES AND CONSEQUENCES OF SYSTEMS OF COMMUNICATION.**
Annual status rept. 1 Oct 64-30 Sep 65,
by Kurt W. Back. 30 Sep 65, 27p. Contract Nonr-1181 (11) Proj. NR-177-470
Unclassified report

See also AD-608 406.

Descriptors: (*Social psychology, Stress (Psychology)), (*Social communication, Psychophysiology), (*Behavior, Group dynamics), Stress (Physiology), Adaptation (Psychology), Emotions, Anxiety, Personality, Perception (Psychology), Motivation, Attitudes, Obesity, Fatty acids, Metabolism, Reaction (Psychology), Sociometrics, Psychometrics, Social sciences, Scientific research

The research is divided into three categories--sociophysiological studies, studies on group structure, and studies on the metholology of social research. Studi s undertaken during the past year are as follows: Group dependence and group effect studies; Group separation study; Control, clarity and stress; Initial experience studies; Obesity study; Conformity studies: Group studies; Logic; Time-sampling as a field technique; Structural changes in task-oriented groups; Group status and perceived status; Role expectations; Integration; Empathy in a factory situation; Methods of social research; Information or noise; Idea-orientation situation; Self-orientation situation; Conflict situation; Apathy situation; Motivation behind doing research.

**AD-625 474 Fld. 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*PRINCETON UNIV N J*
**SIMULATION MODELS FOR PSYCHOMETRIC THEORIES,**
Rept. on Mathematical Techniques in Psychology,
by Carl E. Helm. Nov 65, 38p. Rept. no. rm-65-17
Contract Nonr-1858 (15) Grant ,NSF-GB-3402 Proj. NR-150-088
Unclassified report

Continuation of Grant NSF-G-22889. Prepared for presentation in Proceedings of American Federation of Information Processing Societies v27 Pt 1, Washington, D. C.

Descriptors: (*Psychometrics, Computers), Aptitude tests, Simulation, Theory, Analysis, Decision making, Selection, Performance tests, Programming languages, Verbal behavior, Linguistics

The project is directed to the exploration of the procedures used by psychologists in evaluating a person's performance on a battery of psychological tests or scales. During the course of this research a language was developed and programmed for the 7094 which greatly facilitates the development of test interpretation systems. The basic element of this language is the 'sentence-generating operator' which relates a class of verbal material to a pattern of scores. Any operator may appear as an argument of any other operator, making it possible to represent complex decision rules in a natural way. Moreover, the class of verbal material defined by any operator may occur as an element in the verbal material defined by any other operator, making it possible do develop complex linguistic structures as well. The system is being successfully used to produce clinical interpretations of complex profiles of test scores. (Author)

**AD-625 487 Fld. 5/10**
**CFSTI Prices: HC $5.00 MF $1.00**
*ILLINOIS UNIV URBANA DEPT OF PSYCHOLOGY*
**SOCIAL MOTIVES AND DECISION-MAKING BEHAVIOR IN INTERPERSONAL SITUATIONS.**
Technical rept.,
by William J. Higgs, and Joseph E. McGrath. Sep 65, 153p. Rept. no. tr-4
Contract AF-49 (638)-1291 Proj. 9779 Task 977902
AFOSR 65-1558
Unclassified report

Rept. on Studies in the Social Psychology of Conflict.

Descriptors: (*Decision making, Behavior), (*Behavior, Social psychology), (*Motivation, Behavior), Attitudes, Bargaining, Perception (Psychology), Game theory, Psychometrics, Test construction (Psychology), Factor analysis, Tables

An attempt was made to incorporate stable motivational states into the prediction of behavior in interpersonal studies. From the literature on group process three kinds of behavior were identified and tentative mappings into corresponding motives were made. The research was conducted in 3 experimental stages: (1) The first part investigated whether Ss would consistently describe their motives in terms of the three behavioral areas. Items yielded three factors: Affiliation, Prominence, and Achievement. (2) The second part constructed reliable scales for measuring these factors. (3) The third part was a partial investigation of the relevance of the scales to interpersonal behavior (specifically, a two-person game situation). (Author)

**AD-625 492 Fld. 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*STATE UNIV OF NEW YORK BUFFALO*
**THE EFFECT OF VARIATIONS IN INTERNAL POWER PATTERN ON COALITION FORMATION IN TETRADS.**
Technical rept.,
by Loyda M. Shears. 20 Oct 65, 48p. Rept. no. TR-10
Contract Nonr-4374 (00) Proj. NR-170-270
Unclassified report

Prepared in cooperation with Pacific State Hospital, Pomona, Calif.

Descriptors: (*Group dynamics, Behavior), (*Behavior, Group dynamics), Social psychology, Power, Sex, Motivation, Game theory, Bargaining

The study is an extension of Vinacke's study of alliance formation in triads under differing internal power arrangements. The experiment employed a competitive board game with tetrads homogeneously composed with respect to sex. Weak winning pair alliances with deals related to the players' power weights were typical of triads. The hypotheses that strong winning pair alliances would be typical of tetrads was upheld; however, the weak winning triple alliance appeared above chance expectancy. Division of winnings for pairs was related to that expected on a strictly proportional deal but somewhat larger. Sex of players, internal power distribution, and incentive variation influenced alliance choice and division of the prize. (Author)

**AD-625 542 Fld. 5/10**
*MICHIGAN UNIV ANN ARBOR*
**SEEKING INFORMATION TO REDUCE THE RISK OF DECISIONS,**
by Ward Edwards, and Paul Slovic. 16 Apr 64, 11p. Contract DA-36-039-sc-78801 Grant ,AF-AFOSR-192-63 Proj. MICHIGAN AFOSR 65-2203
Unclassified report

*Availability: Published in American Journal of Psychology v78 p188-97 Jun 1965. Copies to DDC users only.*

Descriptors: (*Decision making, Tests), Probability

Undergraduate Ss (10 men) were asked to perform 528 information-seeking tasks of two types. In standard tasks, S paid for looks at the cells of a 16-cell matrix and was rewarded if he found the unique cell. In inverse tasks, S was fined for finding the unique cell and rewarded for each cell investigated which was not the unique one. The basic dependent variable, strategy-score, was the number of cells S looked at for tasks in which he did not find the unique cell. For tasks in which he did find it, elaborate rules were used to infer what he would have done had he not found it. The Ss performed remarkably well; about half the strategies used were optimal or approximately so, and serious divergences from the optimum were very rare. Performance was less good on standard than on inverse tasks, and slightly less so on tasks with more complex costs and pay-offs than on tasks with simpler costs and pay-offs. Half the Ss were too cautious and half were too incautious in tasks for which both were possible. Individual Ss usually were consistent in being cautious or incautious. (Author)

**AD-625 588 Fld. 5/10**
*ILLINOIS UNIV URBANA GROUP EFFECTIVENESS RESEARCH LAB*
**INTERACTION PROCESS AND TASK OUTCOME IN EXPERIMENTALLY-CREATED NEGOTIATION GROUPS.**
by Joseph E. McGrath, and James W. Julian. 1963, 22p. Contract DA-49-193-MD-2060 Grant ,AF-AFOSR-69-63 AFOSR 65-2174
Unclassified report

*Availability: Published in Journal of Psychological Studies v14 n3 p117-38 1963. Copies to DDC users only.*

Descriptors: (*Group dynamics, Decision making), (*Social communication, Decision making), Social communication, Sociometrics, Behavior

Data were obtained from 60 experimentally-created, four-person negotiation groups. Each consisted of one representative from each of three campus religious foundations plus a graduate student who served as nonpartisan chairman. Each negotiation group was required to develop unaminous agreement on its proposed solution to a socio-political topic on which the foundations held sharply constrasting views. The study focused on analyses of the negotiation process and investigation of relationships between the negotiation process and measures of negotiation effectiveness. (Author)

**AD-625 119** **See Fld. 5/9**

**AD-625 262** **See Fld. 5/5**

AD-625 332 See Fld. 1/3

AD-625 525 See Fld. 6/19

AD-625 528 See Fld. 6/16

## 5/11. SOCIOLOGY

AD-625 234 Fld. 5/11
CFSTI Prices: HC $1.00 MF $0.50
*RAND CORP SANTA MONICA CALIF*
**TOWARD AN INFORMAL AND CREATIVE CONFERENCE METHOD,**
by Benjamin Keller. Dec 65, 15p. Rept. no. p-2701-1

Unclassified report

Descriptors: (*Symposia, Social communication), Social psychology, Group dynamics

A 'meta-socratic' method for conducting conferences suggested. The guiding principles are: (1) Do not take a position either for or against; start anywhere and be free to roam widely. Avoid all assumptions as to fact; when facts become germane, begin by asking how facts are to be established; Adopt an attitude of not being defensive. (2) Use the meta-question freely, this question stimulating a creative mental process instead of evoking an automatic predetermined answer. (3) Make an objective of facilitating the other person's communication. (4) Let the experience of the conference be an important objective. (5) Play down the urge to inform. (6) Enjoy yourself.

AD-625 369 See Fld. 9/2

AD-625 422 See Fld. 5/10

## 6/1. BIOCHEMISTRY

AD-624 889 Fld. 6/1, 6/5
CFSTI Prices: HC $3.00 MF $0.75
*KUMAMOTO UNIV (JAPAN) MEDICAL SCHOOL*
**BIOLOGICAL SIGNIFICANCE OF A PROTEASE INHIBITOR NEWLY ISOLATED FROM ANIMAL TISSUES IN INFLAMMATION.**
Final rept., 1 Jun 64-31 May 65,
by Hideo Hayashi. 31 May 65, 76p. Contract DA-92-557-FEC-37370 Proj. DA-2N014501B71D ARDG(FE) J-196

Unclassified report

*Availability: Microfiche only after original copies exhausted.*

Descriptors: (*Peptide hydrolases, Inhibition), (*Enzyme inhibitors, Healing), Tissues (Biology), Enzymes, Skin, Purification, Antigen-antibody reactions, Tissue culture, Pathology, Molecular weight, Allergy, Permeability, Blood vessels, Histamine, Thiols, Mice, Japan

It is shown that the activity of specific SH-protease (termed Arthus protease) increases in a parallel with the development of cutaneous Arthus reaction, and decreases as the reaction subsides, clearly due to local increase of specific protease inhibitor. The inhibitor, isolated in a highly purified state, is a polypeptide with a molecular weight of 12,500 = 300, and forms a loose complex with the Arthus protease in the local skin site, resulting in inactivation of the protease. The protease-inhibitor complexes seem separated readily by treatment with reduced glutathione or cysteine, and the protease becomes active. When these thiol compounds are locally injected in healing Arthus site, the cutaneous lesions having the same aspect as the original reaction are rapidly induced, accompanying with the reactivation of the Arthus protease inactivated during healing. Such reactivation of the reaction is also observed in the healing skin site of thermal injury and Shwartzman reaction, as a result of easy reactivation of each SH-protease concerned; this type of inflammation is called a SH-type inflammation. Negative reactivation is observed in healing site of croton oil - and ultraviolet light-induced lesion; this type of inflammation is termed a non SH-type inflammation. The above protease inhibitor inactivates the Arthus protease but has no effect on trypsin and chymotrypson. (Author)

AD-624 960 Fld. 6/1, 6/13
*PRAIRIE REGIONAL LAB SASKATOON (SASKATCHEWAN)*
**BIOSYNTHESIS OF PULCHERRIMINIC ACID,**
by J. C. MacDonald. 20 Nov 64, 6p. NRC 8541

Unclassified report

*Availability: Published in Biochem. J. v96 p533-8 1965. Copies to DDC users only.*

Descriptors: (*Organic pigments, Biosynthesis), (*Fungi, Organic pigments), (*Amino acids, Metabolism), (*Candida, Organic pigments), Culture media, Peptides, Cyclic compounds, Molecular isomerism, Canada

Candida pulcherrima was grown on a complex medium to which various compounds had been added to determine their effect on the biosynthesis of pulcherriminic acid. Most of the pulcherriminic acid synthesized by C. pulcherrima PRL2019 was derived from the L-/1-C14/ leucine added to the medium. The cyclic dipeptide of L-leucine (cyclo-L-leucyl-L-leucyl) was shown, by trapping experiments involving cycloleucyl-leucyl isomers, to be synthesized by strain PRL2019. Cyclo-L-leucyl-Lleucyl was derived from L-leucine and was converted into pulcherriminic acid. Cyclo-L-leucyl-L-leucyl was a precursor of pulcherriminic acid in strain PRL2007 also. The results supported the hypothesis that pulcherriminic acid is derived from L-leucine and that cyclo-L-leucyl-Lleucyl is an intermediate in the biosynthesis. (Author)

AD-625 473 Fld. 6/1, 6/13
CFSTI Prices: HC $1.00 MF $0.50
*INSTITUTO VENEZOLANO DE INVESTIGACIONES CIENTIFICAS CARACAS DEPARTAMENTO DE PATOLOGIA EXPERIMENTAL*
**CYTOCHEMISTRY AND BIOCHEMISTRY OF P. BRASILIENSIS.**
Annual technical rept. no. 1, 15 Oct 64-15 Oct 65,
by Luis M. Carbonell. Nov 65, 17p. Contract DA-ARO-49-092-64-G60 Proj. DA-2N014501B71D-00-020-LA

Unclassified report

Descriptors: (*Fungi, Biochemistry), (*Cytochemistry, Fungi), Immunology, Tissue extracts, Oxidoreductases, Histological techniques, Mitochondria, Cytoplasm, Glycerols, Metabolism, Glycogen, Polysaccharides, Yeasts, Enzymes, Cell structure, Venezuela

The high amount of intrinsic factors which reduced NBT is a serious chalenge to demonstrate dehydrogenase and diaphorase in the P. brasiliensis fungus. To overcome this difficulty, extraction with acetone and an alkalized buffer was used. With this procedure there was an extraction of several components. It was demonstrated histochemically that succinic acid, DPN, TPN, DPNH and TPNH were extracted. In relation with the intrinsic factor which endogeneously reduced NBT, it was shown that succinic acid played a minor role as endogeneous substrate, while DPNH and TPNH played the main role. The dehydrogenases and diaphorases are located in the mitochondrias, but there is always some reduction of formazan in the cytoplasm. Since the mitochondrias were so well visualized with these techniques, a complete description of them was made. The demonstration of alpha-glycerophosphate dehydrogenase shows that glycerol fermentation is taking place via glicolisis. The presence of L-malic, DL-isocitric and succinic dehydrogenase points out the TCA cicle in the fungus. Demonstration of glucose-6-phosphate dehydrogenase shows that pentose cicle takes place in P. brasiliensis. (Author)

AD-625 495 Fld. 6/1, 8/1
CFSTI Prices: HC $2.00 MF $0.50
*IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF BOTANY*
**PHOTOSYNTHETIC MECHANISMS UNDER SUB-OPTIMAL CONDITIONS.**
Final scientific rept.,
by C. P. Whittingham. Oct 65, 31p. Contract AF-EOAR-65-2 AFOSR 65-2649

Unclassified report

Descriptors: (*Photosynthesis, Oxygen), (*Chlorella, Photosynthesis), Acetic acids, Alcohols, Biosynthesis, Carbon dioxide, Saccharide phosphates, Sucrose, Labeled substances, Great Britain

The influence of oxygen partial pressure on the production of glycollate during photosynthesis in Chlorella was investigated. Under some conditions glycollate was shown to be an intermediate in the synthesis of sucrose. (Author)

AD-625 626 Fld. 6/1, 6/13
CFSTI Prices: HC $1.00 MF $0.50
*ARMY BIOLOGICAL LABS FREDERICK MD*
**GAS-LIQUID CHROMATOGRAPHY OF METHYL ETHERS OF HIGHER FATTY ACIDS OF SENDAI VIRUS LIPID COMPONENT,**
by G. A. Smirnova, and A. Yu. Virkus. Jun 65, 9p. Rept. no. translation-1374
TT 66-60112

Unclassified report

Trans. of Voprosy Virusologii (USSR) v9 n4 p417-21 1964.

Descriptors: (*Sendai virus, Fatty acids), (*Fatty acids, Ethers), (*Ethers, Chromatographic analysis), (*Lipids, Sendai virus), USSR, Gas chromatography

By using the method of gas-liquid chromatography with sponge glass (solid phase) and polyethyleneglycol succinate (liquid phase) as the filler, a quantitative and qualitative determination was performed of the fatty acids found in the composition of the Sendai virus. The proposed method may be used for the quantitative and qualitative analysis of fatty acids found in the composition of the lipid component of animal viruses. (Author)

AD-625 097 See Fld. 6/3

AD-625 263 See Fld. 6/11

AD-625 494 See Fld. 6/16

AD-625 521 See Fld. 6/5

## 6/3. BIOLOGY

AD-624 871 Fld. 6/3
*PENNSYLVANIA HOSPITAL PHILADELPHIA DEPT OF MOLECULAR BIOLOGY*
**THE MEMBRANE THEORY AND OTHER VIEWS FOR SOLUTE PERMEABILITY, DISTRIBUTION, AND TRANSPORT IN LIVING CELLS,**
by Gilbert N. Ling. 1965, 20p. Contract ONR-I-2060-66 ,PHS-GM-11422-01

Unclassified report

*Availability: Published in Perspectives in Biology and Medicine v9 n1 p87-106 1965. Copies to DDC users only.*

Descriptors: (*Cells (Biology), Transport properties), (*Cytoplasm, Transport properties), Membranes (Biology), Semipermeability, Distribution, Theory, Solutions, Ions

AD-624 897 Fld. 6/3
CFSTI Prices: HC $1.00 MF $0.50
*GEOSCIENCE LTD LA JOLLA CALIF*
**THERMAL AND ELECTRICAL CONDUCTIVITIES OF BIOLOGICAL FLUIDS AND TISSUES.**
Quarterly rept. 1 Jul-30 Sep 65,

by H. F. Poppendiek, N. D. Greene, R. Randall, J. R. Murphy, and W. A. Morton. 30 Sep 65, 22p. Rept. no. glr-40
Contract Nonr-4095 (00)

Unclassified report

Descriptors: (*Body fluids, Conductivity), (*Tissue extracts, Conductivity), Thermal conductivity, Electrical conductance, Blood, Fats, Muscles, Eggs, Brain

The thermal conductivities of unstressed samples of calf muscle, bovine fat, egg yolk, blood and PVP additive were measured. Also, the thermal conductivities of all the biological fluids and tissues studied to date were predicted using mathematical, heat conduction models which are based on the premise that all biological material is composed of three primary materials, namely, water, fat and protein. With the exception of one stratified biological species, the predicted conductivities for one of the mathematical models deviate from measured values by =3% or less. The electrical conductivity of unstressed, homogenized bovine brain was measured; the conductivity varied from about 0.004/ (ohm-cm) at 27C to about 0.005/ (ohm-cm) at 45C. Also, the electrical conductivity of whole blood was calculated using the mathematical conductivity models studied previously for the prediction of thermal conductivity; blood was postulated to be composed primarily of plasma and blood cells, whose conductivity had separately been determined experimentally. The Eucken equation yielded the best predictions. (Author)

**AD-624 956 Fld. 6/3**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES*
**SEASONAL ACCLIMATIZATION IN VARYING HARE (LEPUS AMERICANUS),**
by J. S. Hart, Hermann Pohl, and J. S. Tener. 2 Feb 65, 15p. NRC 8598

Unclassified report

Prepared in cooperation with Canadian Wildlife Service, Ottawa (Ontario).

*Availability: Published in Canadian Journal of Zoology, v43 p731-44 1965. Copies to DDC users only.*

Descriptors: (*Acclimatization, Rabbits), (*Rabbits, Acclimatization), Body temperature, Shivering, Tolerances (Physiology), Oxygen consumption, Heat production (Biology), Heat tolerance, Evaporation, Periodic variations, Canada

Wild hares were trapped in the vicinity of Ottawa, Canada, and tested during summer and winter. Measurements of oxygen uptake and body temperatures were made during successive stepwise lowering of ambient temperatures were made during successive stepwise lowering of ambient temperature from 20C to -45C over about 5 hours. Measurements were also made during stepwise elevation of temperature from 12C to 38C over a 5-hour period and a final single test was made at 40C. Hares trapped during the winter had lower O2 uptake than did summer-caught hares at temperatures below thermal neutrality. The lower critical temperature was shifted from + 10C in summer hares to about -5C in winter hares. Varying hares showed a considerable tolerance to elevation of temperature and a capacity to maintain approximate equality of body and ambient temperature at 40C for some time through effective respiratory evaporative heat loss, which approached 100% of heat production. Stepwise elevation of ambient temperature did not reveal any seasonal differences in upper critical temperature (about 38C) or in elevation of body temperature in spite of differences in insulation of the fur. (Author)

**AD-625 025 Fld. 6/3, 6/5, 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF MEDICAL MICROBIOLOGY AND IMMUNOLOGY*
**HOST PRECIPITIN ANTIBODY PRODUCTION IN RELATION TO DIFFERENTIATION AND GROWTH OF PARASITIC ROUNDWORMS.**
Final progress rept., 1 Sep 64-31 Aug 65,
by Marietta Voge. 31 Aug 65, 9p. Contract Nonr-233 (94)

Unclassified report

Descriptors:(*Trichinells, Antigens + antibodies), Parasitic diseases, Infections, Nematodes, Platyhelminths, Larvae, Life cycle, Morphology (Biology), Growth, Pathology, Immune serums, Electrophoresis, Histological techniques, In vitro analysis, Rats, Rabbits

The main function of the work was to relate the development and changes in precipitating antibodies to the morphological changes during growth of T. spiralis larvae by immunoelectrophoresis and histological techniques. Cross reaction studies were performed with other parasitic worms in an attempt to isolate the different antigenic components.

**AD-625 034 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*TUFTS UNIV MEDFORD MASS DEPT OF BIOLOGY*
**SUMMARY REPORT.**
Rept. for 1 Jun 64-31 Aug 65,
by Kenneth D. Roeder. 31 Aug 65, 4p. Contract AF-AFOSR-671-64 AFOSR 65-2223

Unclassified report

Descriptors: (*Insects, Sensory perception), Nerves, Electrophysiology, Sound, Nerve cells, Nerve fibers, Ganglia, Behavior, Lepidoptera, Bats

Summaries are presented of the following: Central neurons activated by the tympanic nerve fibers of Noctuid moths; Sensitivity of the moth tympanic organ and its range for cries of echolocating bats; Behavioral significance of the ultrasonic clicks made by Arctiid moths.

**AD-625 097 Fld. 6/3, 6/1**
*PENNSYLVANIA UNIV PHILADELPHIA DEPT OF BIOLOGY*
**LIGHT EFFECTS ON OXYGEN EVOLUTION AND PHOSPHORYLATION IN SPINACH CHLOROPLASTS,**
by Martin Schwartz. 2 Oct 64, 12p.

Unclassified report

*Availability: Published in Biochemica et Biophysica Acta v102 p361-72 1965. Copies to DDC users only.*

Descriptors: (*Chloroplasts, Phosphorylation), (*Phosphorylation, Chloroplasts), (*Photosynthesis, Oxygen), Plants (Botany), pH, Light, Intensity, Adenosine phosphates, Synthesis, Ammonium compounds, Ions, Phenols

The coupling between O2 evolution and phosphorylation (non-cyclic photophosphorylation) in spinach chloroplasts at rate-saturating and rate-limiting light intensities exhibits the following properties. The pH profile of O2 evolution is similar to the pH profile of concomitant phosphorylation at rate-saturating intensities but differs from the pH profile of phosphorylation at rate-limiting light intensities. The addition of ADP stimulates the rate of O2 evolution at rate-saturating intensities, but does not stimulate the rate of O2 evolution at rate-limiting light intensities. Calculated values for P/O ratios approach unity at rate-saturating and rate-limiting intensities, indicating an obligate coupling between phosphorylation and electron flow (O2 evolution) in the presence of the phosphorylating system. Ammonium salts uncouple phosphorylation from O2 evolution at rate-saturating and ratelimiting intensities, but ammonium salts stimulate the rate of O2 evolution only at rate-saturating intensities. This stimulated rate of O2 evolution is independent of the concentration of phosphate ions. Also, the rate of O2 evolution is not influenced by the presence or absence of phosphate ions at rate-limiting or rate-saturating light intensities. Quantum efficiency determinations of noncyclic photophosphorylation are equivalent with either ferricyanide or NADP employed as oxidant. (Author)

**AD-625 100 Fld. 6/3**
**CFSTI Prices: HC $4.00 MF $1.00**
*MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY*
**INDEX CATALOGUE TO RUSSIAN, CENTRAL AND EASTERN EUROPEAN, AND CHINESE LITERATURE IN MEDICAL ENTOMOLOGY. VOLUME 9. VIRAL DISEASES,**
by Alena Elbl. 1965, 134p. Contract DA-49-193-MD-2238 TT 66-60038

Unclassified report

See also AD-624 160.

Descriptors: (*Disease vectors, Virus diseases), (*Virus diseases, Indexes), Cancer, Arboviruses, Dengue, Anemias, Neisseriaceae, Diseases, Influenza virus, Louping ill virus, Poliomyelitis virus, Rabies virus, Variola viruses, Equine encephalomyelitis virus, Japanese B encephalitis virus, Murray Valley encephalitis virus, Russian spring summer encephalitis virus, Venezuelan equine encephalomyelitis virus, West Nile virus, Yellow fever virus, Ecology, Etiology, Epidemiology, USSR, China, Eastern Europe

**AD-625 101 Fld. 6/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*WISCONSIN ALUMNI RESEARCH FOUNDATION MADISON*
**SURVEY OF EXISTING METHODS OF FEEDING AND HOUSING THE CHIMPANZEE.**
Final rept. Jun 63-May 65,
by Paul O. Nees, and Philip H. Derse. Aug 65, 38p. Contract AF33 (657)-11348 Proj. AF-6892 Task 689201
ARL TR-65-11

Unclassified report

Descriptors: (*Chimpanzees, Reviews), Food, Diet, Handling, Housing, Laboratory animals

Background information concerning feeding, housing and handling of the chimpanzee was obtained during visits to major zoological parks and several laboratories maintaining chimpanzees. Information on the habits of the chimpanzee in the wild was obtained and where applicable, this knowledge was used to better understand some of the problems involved in maintaining caged chimpanzees for laboratory purposes. A movable cage with feeder and water was designed to hold chimpanzees from 2 to 6 years old. Methods of handling employing negative and positive reward methods were compared. Diets were compared and revealed zoological parks generally fed a ration of fresh fruits and vegetables with cooked cereals and milk and small quantities of commerical chimp biscuits. Laboratories generally fed the commercial chimp biscuits supplemented with small quantities of fresh fruit and vegetables. (Author)

**AD-625 274 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY*
**CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOLUME 4, NO. 12,**
by Alena Elbl. 1965, 18p. Contract DA-49-193-MD-2238 TT 66-60060

Unclassified report

See also AD-624 159.

Descriptors: (*Disease vectors, Indexes), (*Insects, Disease vectors), Ticks, Mites, Diptera, Siphonaptera, Lice, Bacteria, Spirochaeta, Protozoa, Rickettsia, Virus diseases, Diseases, Epidemiology, USSR, Eastern Europe, China, Pest control, Insect control

**AD-625 299 Fld. 6/3**
*AMERICAN MUSEUM OF NATURAL HISTORY NEW YORK DEPT OF ANIMAL BEHAVIOR*
**AUDITORY CAPACITIES IN FISHES: THRESHOLD VARIABILITY IN THE BLUE-STRIPED GRUNT, HAEMULON SCIURUS,**
by William N. Tavolga, and Jerome Wodinsky.
Nov 64, 12p. Contract Nonr-552 (06) Grant, NSF-GB-1574 Proj. NR-301-322
Unclassified report

Prepared in cooperation with Brandeis Univ., Waltham, Mass. Dept. of Psychology.

*Availability: Published in Animal Behaviour v13 n2-3 p301-11 1964. Copies to DDC users only.*

Descriptors: (*Fishes, Auditory perception), (*Auditory perception, Fishes), Audiofrequency, Thresholds (Physiology), Conditioned reflex, Behavior

Auditory thresholds in the blue-striped grunt, Haemulon sciurus (Pisces, Family Pomadasyidae) were determined by the use of avoidance conditioning. A total of 421 threshold determinations on 23 subjects showed both intra and inter-individual variability. The thresholds from 50 c.p.s. to 200 c.p.s. averaged about 20 db below one microbar, and from 300 c.p.s. the threshold curve rose along an exponential curve to a maximum of 39 db above one microbar at 1,000 c.p.s. The accuracy of the obtained thresholds was about ±2.5 db taking both equipment and testing errors into account. Repeated tests of the same animals at the same frequencies resulted in progressively lower thresholds, and three successive tests were generally required to determine the lowest threshold. This variation was greatest at frequencies below 300 c.p.s. Individual differences in auditory sensitivity among the several animals were distinct, with variations over 10 db at some frequencies. These individual differences were most apparent at frequencies below 300 c.p.s. The latency of response to the signal rose as the threshold was approached, but the frequency of intertrial crossings decreased significantly. The testing method was based on the 'staircase' technique, and both 2 db and 5 db steps were used. No significant difference in threshold was observed for the two step sizes. (Author)

**AD-625 333 Fld. 6/3, 6/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*AEROMEDICAL RESEARCH LAB (6571ST) HOLLOMAN AFB N MEX*
**THE REFRACTIVE CHARACTERISTICS AND INTRAOCULAR TENSIONS OF COLONY CHIMPANZEES,**
by Donald N. Farrer, and Francis A. Young.
Nov 65, 17p. Rept. no. arl-TR-65-23
Proj. 6893 Task 689302
Unclassified report

Descriptors: (*Chimpanzees, Vision), (*Vision, Aging (Physiology)), (*Eye, Pathology), Refractive index, Posture, Retina, Sex, Statistical analysis

Ninety-six chimpanzees, 54 males and 42 females, ranging in age from less than 3 years to 15 years, were refracted in both supine and sitting positions under Sernylan (proprietary preparation of the Parke-Davis Company) anesthesia and Cyclogyl (proprietary preparation of the Schieffelin Company) cycloplegia. Intraocular pressures were obtained under the same conditions. High reliability ($r = +.930$ overall) between refractions and the tendency toward increasing minus refractive error as a function of age was confirmed. (Author)

**AD-625 610 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**ZOONOSES OF LABORATORY ANIMALS AND THEIR DANGER TO MAN,**
by A. I. Metelkin. Jun 65, 7p. Rept. no. translation-1387
TT 66-60099
Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v40 n5 p113-7 1963.

Descriptors: (*Laboratory animals, Diseases), Infections, Biological laboratories, Safety, Hygiene, Sanitary engineering, Vaccines, Immune serums, USSR

**AD-625 624 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**STRIGA LUTEA,**
by R. A. Safra. Jun 65, 7p. Rept. no. translation-1370
TT 66-60110
Unclassified report

Trans. of Zashchita Rastenii ot Vreditelei i Bolezznei (USSR) v9 n7 p40-1 1964.

Descriptors: (*Plants (Botany), Parasites), Diseases, Agriculture, Seeds, Germination, Growth, Fertilizers, Herbicides, United States, USSR

**AD-625 625 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**CONTRIBUTION TO THE BIOLOGY OF THE TICK ORNITHODOROS PAPILLIPES,**
by E. N. Pavloskii, and A. N. Skrynnik. Jun 65, 6p. Rept. no. translation-1376
TT 66-60111
Unclassified report

Trans. of Akademiya Nauk SSSR. Doklady v111 n6 p1403-5 1956.

Descriptors: (*Ticks, Spirochaeta), Disease vectors, Life cycle, Life span, Starvation, Reproduction (Physiology), USSR

**AD-625 627 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**THE FUNCTIONAL MORPHOLOGY OF ORNITHODOROS TICKS,**
by E. N. Pavlovskii. Jun 65, 10p. Rept. no. translation-1379
TT 66-60113
Unclassified report

Trans. of Parazitologicheskii Sbornik (USSR) v19 p26-31 1960.

Descriptors: (*Ticks, Morphology (Biology)), USSR

Mechanism of the motion of coxa, trocnanter and intercalar articulation and some joint muscles of the legs (ticks of the genus Ornithodoros) is defined. The description of two functions of the cheeks of ticks (protective and supporting) in connection with gnathosoma is given. (Author)

**AD-625 633 Fld. 6/3, 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**EXPERIMENTAL ANALYSIS OF THE IMPORTANCE OF THE DIFFERENT PHASES IN THE METAMORPHOSIS OF ORNITHODOROS PAPILLIPES IN THE TRANSMISSION OF THE SPIROCHAETES OF TICK-BORNE RELAPSING FEVER,**
by E. N. Pavlovskii, and A. N. Skrynnik. Jun 65, 14p. Rept. no. 1378
TT 66-60119
Unclassified report

Trans. of Parazitologicheskii Sbornik (USSR) v19 p47-55 1960.

Descriptors: (*Ticks, Spirochaeta), (*Disease vectors, Ticks), Morphology (Biology), Life cycle, Larvae, Adults, Parasitic diseases, Infections, Bites + stings, Swine, Humans, USSR

Larvae, fully or partially engorged on infected pigs, during repeated feeding in the same phase of development, attached themselves on a small scale and did not infect pigs. Considering that larvae which received spirochaetes by the transovarian route caused illness only in rare cases, the role of larvae in the transmission of spirochaetes to susceptible mammals must be considered as insignificant, but they do represent a phase during which the mass infection of ticks by spirochaetes can take place. Nymphs, infected in the previous stage or in the larval phase, infected pigs as a rule. Adult ticks may be infected with spirochaetosis either during the adult phase or by receiving the spirochaetes in one of the previous phases of metamorphosis. Adult ticks which have fed on infected pigs became capable of transmitting the spirochaete in no less than 100 days, and often weren't infected at all. The significance of the various phases of development of Ornithodoros papillipes ticks in the infection of humans with tick-borne relapsing fever is unequal. The bites of larvae may cause illness only in exceptional cases. Nymphs, in passing through the several phases of their development, require nourishment more frequently than adults. The feeding of one state I nymph is sufficient for infecting a guinea pig. (Author)

**AD-625 640 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**THE REACTION OF ORNITHODOROS PAPILLIPES BIR. TO SOME PHYSICAL FACTORS OF THE ENVIRONMENT,**
by E. N. Pavlovskii. Jun 65, 16p. Rept. no. 1375
TT 66-60120
Unclassified report

Trans. of Parazitologicheskii Sbornik (USSR) v12 p3-12 1950.

Descriptors: (*Ticks, Adaptation (Physiology)), Ecology, Environment, Illumination, Light, Test methods, USSR

**AD-625 641 Fld. 6/3, 2/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**SEMINAR ON NEW ENSILAGE FORAGE PLANTS,**
by V. S. Sokolov, and P. F. Medvedev. Aug 64, 8p. Rept. no. 1151
TT 66-60121
Unclassified report

Trans. of Botanicheskii Zhurnal (USSR) v48 n9 p1404-6 1963.

Descriptors: (*Plants (Botany), Symposia), Agriculture, Growth, Morphology (Biology), Scientific research, Scientific personnel, USSR

**AD-625 644 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**TEMPERATURE CHANGES IN THE BODY OF ORNITHODOROS PAPILLIPES DURING BLOODSUCKING,**
by I. V. Neuimin. Jun 65, 9p. Rept. no. 1384
TT 66-60123
Unclassified report

Trans. of Zoologicheskii Zhurnal (USSR) v33 n2 p356 1954.

Descriptors: (*Ticks, Body temperature), Bites + stings, Life cycle, Nutrition, Blood, Adaptation (Physiology), USSR

The act of bloodsucking in the ticks O. papillipes can be divided into three successive phases: The phase of settlement, adherence by suction, and engorgement. Each phase can be realized only at a specific body temperature of the tick. The low temperature limit for the first phase is a temperature of 13C, for the second and third phases -- 23C. At low temperatures the periods for engorgement are sharply prolonged, which permits the transfer of ticks by the hosts for considerable distances from their initial biotopes. (Author)

**AD-625 653 Fld. 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**THE EFFECT OF REDUCED ATMOSPHERIC PRESSURE AND SEVERAL GASES ON THE TICKS ORNITHODOROS PAPILLIPES BIR.,**
by E. N. Pavlovskii, and I. K. Teravskii. Jun 65, 7p. Rept. no. translation-1377
TT 66-60127

Unclassified report

Trans. of Akademiya Nauk SSSR. Doklady v109 n6 p1133-5 1956.

Descriptors: (*Ticks, Adaptation (Physiology)), Barometric pressure, Gases, Oxygen, Hydrogen, Nitrogen, Carbon dioxide, Hydrogen compounds, Sulfides, Toxicity, Environment, USSR

**AD-624 899 See Fld. 12/1**

**AD-625 263 See Fld. 6/11**

**AD-625 416 See Fld. 6/12**

**AD-625 647 See Fld. 6/13**

**AD-625 657 See Fld. 6/13**

## 6/4. BIONICS

**AD-624 864 Fld. 6/4, 9/2**
**CFSTI Prices: HC $6.00 MF $1.50**
*ILLINOIS UNIV URBANA ELECTRICAL ENGINEERING RESEARCH LAB*
**A STUDY OF A FAMILY OF COMPLEX SYSTEMS: AN APPROACH TO THE INVESTIGATION OF ORGANISMS BEHAVIOR.**
Technical rept.,
by Crayton C. Walker. Jun 65, 271p. Rept. no. tr-5
Contract AF-AFOSR-7-64 ,NSF-GP-700 Proj. AF-7969 Task 9769-04
AFOSR 65-1713

Unclassified report

Descriptors: (*Artificial intelligence, Models (Simulations)), (*Models (Simulations), Behavior), Automata, Mathematical prediction, Information theory, Computer logic, Adaptive systems, Programming (Computers), Systems engineering

A family of complex systems is examined which is defined with reference only to theoretically basic characteristics of the systems' parts and their interrelationship. The systems considered are intricate structures built up of simple electrical devices called elements which interact with one another. Each element has two possible elementstates, with its present state determined from states of other elements and from its previous state by a fixed transformation. Given a particular transformation, a system is constructed by taking 100 elements embodying that transformation and joining them at random. The system's behavior is studied by examining its cycles under operation. Then a different system is built using the same elements and the sampling of behavior repeated. Systems are compared, and it is found that for many transformations, details of structure are evidently unimportant in the occurrence of certain types of behavior.(Author)

**AD-625 225 Fld. 6/4, 9/2**
**CFSTI Prices: HC $4.00 MF $1.00**
*NAVAL ORDNANCE LAB WHITE OAK MD*
**SYNTHETIC NERVE NETWORKS.**
Final rept.,
by Alfred J. Cote,Jr.. 27 Apr 65, 141p. Rept. no. noltr-65-55
Task RREN-04/012/212/1/F008-21/02,RUDC-4B-000/212-1/F001-05-02

Unclassified report

Descriptors: (*Learning machines, Microminiaturization (Electronics)), (*Pattern recognition, Learning machines), (*Bionics, Microminiaturization (Electronics)), (*Artifical intelligence, Pattern recognition), Analog systems, Vision, Sound, Sensory mechanisms, Nerve cells, Nervous systems, Simulation

Most models of pattern recognition processes are conceived without regard to the difficulties which might be anticipated if one had to fabricate a full scale engineering model embodying the proposed principles. This report discusses recognition systems which take into account the fabrication limitations one would expect to encounter in the construction of extremely high density microelectronic pattern recognition systems. The resulting analog systems respond to transient patterns and the various artificial neurons within them exhibit functional behavior comparable to that found in biological prototypes. The application of these principles is first discussed in terms of a visual processing system which would exhibit many of the properties attributed to nerve fibres in the visual systems of frogs and cats, including those line sensing properties attributed by Hubel to fibres in the cat's visual cortex. The manner in which these same principles can be applied to the problem of sound recognition is then considered. Methods of realization, and an important function of learning in such systems, are also discussed. (Author)

**AD-625 410 See Fld. 6/5**

**AD-625 567 See Fld. 5/8**

## 6/5. CLINICAL MEDICINE

**AD-624 990 Fld. 6/5, 6/16**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**UPPER EXTREMITY PROSTHETICS RESEARCH. HUMAN TRACKING. SENSORY MOTOR CONTROL. MYOELECTRIC CONTROL.**
Progress rept. for 15 Jul-15 Oct 65.
15 Oct 65, 34p. Rept. no. ucla-DE-65-53
Contract V1005p-9779 ,N123 (60530)32857A

Unclassified report

Descriptors: (*Prosthetics, Medical research), (*Muscles, Electrophysiology), (*Motor reactions, Control systems), Hands, Arms, Human engineering, Pneumatic devices, Transducers, Bionics, Sensory mechanisms, Training

**AD-625 031 Fld. 6/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*COLUMBIA UNIV NEW YORK*
**THE RELATION BETWEEN CRANIOCEREBRAL TRAUMA AND ITS SEQUELAE.**
Final rept. 1 Oct 63-30 Sep 65,
by William Fields Caveness. 1 Oct 65, 3p. Contract Nonr (G)-00036-64

Unclassified report

Descriptors: (*Head, Wounds + injuries), Epilepsy, Electroencephalography, Brain, Neurology, Military personnel

**AD-625 111 Fld. 6/5**
*NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN) DEPT OF BIOCHEMISTRY*
**HAEMOGLOBIN E IN VIETNAMESE.**
Research rept.,
by R. Quentin Blackwell, Jeanette Tung-Hsiang Huang, and Li-Chin Chien. 1964, 3p.
NAVMED MF022.03.07-2004.11

Unclassified report

*Availability: Published in Nature v207 n4998 p768 Aug 14 1965. Copies to DDC users only.*

Descriptors: (*Hemoglobin, Blood diseases), (*Blood diseases, Vietnam), Erythrocytes, Electrophoresis, Taiwan

**AD-625 241 Fld. 6/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**NERVES OF IRON,**
by O. Layne. 15 Dec 65, 6p. Rept. no. ftd-TT-65-672
TT 66-60047

Unclassified report

Unedited rough draft trans. of Pravda, Leningrad (USSR) 5 Dec p4 1961.

Descriptors: (*Prosthetics, Nerves), (*Nerves, Prosthetics), Nerve fibers, Nerve impulses, Cranial nerves, Dogs, USSR

**AD-625 279 Fld. 6/5, 6/16**
*LOYOLA UNIV CHICAGO ILL DEPT OF PHYSIOLOGY*
**MYOCARDIAL CATECHOLAMINES AND STIMULATION OF THE STELLATE GANGLION IN HEMORRHAGIC SHOCK,**
by Vincent V. Glaviano, and Mary Ann Klouda.
11 Aug 64, 6p. Contract Nonr-3502 (01) Proj. NR-101-521

Unclassified report

*Availability: Published in American Journal of Physiology v209 n4 p751-6 Oct 1965. Copies to DDC users only.*

Descriptors: (*Heart, Shock (Pathology)), (*Shock (Pathology), Heart), Autonomic nervous system, Ganglia, Stimulation, Hemorrhage, Blood transfusions, Levarterenol, Epinephrine, Nerves, Cardiovascular diseases, Blood pressure

Cardiac responses to electrical stimulation of the right or left stellate ganglion were recorded from 16 open-chest anesthetized dogs in hemorrhagic shock. Shock was induced by bleeding the animals to a mean blood pressure of 40 mm Hg. This level of pressure was maintained for 4 hr. during which time blood pressure, heart rate, force of myocardial contraction, and intraventricular pressures were recorded. Stimulation of the stellate ganglion for 15-40 sec every 30 min after hemorrhage showed a gradual decrease in these parameters to levels below control. The reinfusion of blood and the infusion of exogenous l-norepinephrine did not restore an increase in force of cardiac contraction to stellate stimulation. Myocardial epinephrine and norepinephrine levels in shock were found not to differ from those in 14 normal dog hearts. In contrast to almost complete myocardial refractoriness to stellate stimulation in hemorrhagic shock, stimulation of the vagus nerve elicited bradycardia and eventual cardiac arrest. The decrease observed in force of cardiac contraction to stimulation of the stellate ganglion in hemorrhagic shock may be due to depletion of norepinephrine stores in the heart. (Author)

**AD-625 281 Fld. 6/5**
*PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY*
**FLASH BLINDNESS,**
by John Lott Brown. Sep 65, 17p. Contract

Nonr-551(49) Grant ,PHS-B-2205
Unclassified report

*Availability: Published in American Journal of Ophthalmology v60 n3 p505-20 Sep 1965. Copies to DDC users only.*

Descriptors: (*Flashblindness, Wounds + injuries), Eye, Adaptation (Physiology), Sensitivity, Solar radiation, Nuclear explosions, Space flight, Illumination, Luminescence, Retina, Vision, Mathematical prediction, Safety devices, Eyeglasses, Ophthalmology

Possible eye injuries and the change in sensitivity of the eye following exposure to high energy levels are discussed in relation to light from the sun and from atomic bomb bursts. Laboratory studies of the transient, relative blindness which follows exposure to high luminance light flashes are reviewed. A mathematical formulation is presented which permits prediction of the duration of blindness following a bright flash before a known target at specified luminance can be seen. The formulation predicts that elevation of target luminance to 500 ft-L will afford target visibility within two or three seconds after exposure to any blinding flash as long as there is insufficient energy in the flash to cause retinal injury. Various protective techniques are discussed. (Author)

**AD-625 410 Fld. 6/5, 6/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*RAND CORP SANTA MONICA CALIF*
**SPIKE PROBABILITIES IN NEURONES: INFLUENCE OF TEMPORAL STRUCTURE IN THE TRAIN OF SYNAPTIC EVENTS,**
by Jose P. Segundo, Donald H. Perkel, and George P. Moore. Dec 65, 79p. Rept. no. rm-4579-NIH
Contract PHS-GM-09608-04
Unclassified report

Descriptors: (*Nerve impulses, Probability) Time, Statistical analysis, Nerve cells, Bionics, Ganglia, Cybernetics, Digital computers

Certain input-output relations were studied by way of intraneuronal recordings in isolated visceral ganglia of Aplysia californica. All cells exhibited a prolonged sequence of excitatory postsynaptic potentials (EPSP's) of a single type and, as a consequence, produced recurrent spikes. EPSP's either (1) occurred 'spontaneously' or (2) were initiated by stimulating a connective with shocks from a stimulator driven by a Geiger counter. The prespike epoch was analyzed and the events that trigger the postsynaptic spike were identified in a probabilistic manner. Experiments in digital-computer-simulated neurons reproduced and extended the results of animal experiments.

**AD-625 459 Fld. 6/5**
*NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN) DEPT OF BIOCHEMISTRY*
**HAEMOGLOBIN J AND E IN A THIA KINDRED.**
Research rept.,
by R. Quentin Blackwell, Boon-Nam Blackwell, Jeanette Tung-Hsiang, and Chamras Thephusdin. 1964, 5p. NAVMED MR005.09-1601.7.8
Unclassified report

*Availability: Published in Nature v207 n4998 p767-8 Aug 14 1965. Copies to DDC users only.*

Descriptors: (*Hemoglobin, Blood diseases), (*Blood diseases, Thailand), Genetics, Electrophoresis, Erythrocytes, Taiwan

**AD-625 521 Fld. 6/5, 6/1, 6/15**
*TORONTO UNIV (ONTARIO) DEPT OF CARDIOVASCULAR SURGERY*
**EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OF EHTHANOL FROM ARTERIAL BLOOD,**
by D. C. MacGregor, E. Schonbaum, and W. G. Bigelow. 31 Aug 64, 6p.
Unclassified report

*Availability: Published in American Journal of Physiology v208 n5 p1016-20 May 1965. Copies to DDC users only.*

Descriptors: (*Hypothermia, Ethanols), (*Ethanols, Blood chemistry), (*Surgical techniques, Hypothermia), Epinephrine, Parenteral infusions, Oxidoreductases, Alcohols, Liver, Body fluids, Cardiovascular system, Metabolism, Dogs, Canada

Normothermic and hypothermic (24C) dogs were given ethanol intravenously and the rates of accumulation and disappearance of ethanol from arterial blood were studied, with the following results: (1) The rate of decrease of ethanol concentration in the arterial blood in normoand hypothermic dogs was similar. (2) Extrapolation of concentration vs. time curves after equilibration showed reduction in apparent total available body-water space in hypothermic dogs. (3) Equilibration took twice as long in hypothermic as in normothermic dogs. (4) A fourfold increase of tidal volume did not affect the disappearance of ethanol in a normothermic dog. (5) The disappearance rate of ethanol in hypothermic dogs was decreased by hexamethonium or a small dose of epinephrine, but normalized by a pressor dose of epinephrine. It is suggested that the effects of hypothermia on hepatic blood flow and on alcohol dehydrogenase activity tend to cancel each other out. Modification of the rate of alcohol disappearance by hexamethonium and by epinephrine probably results from changes in hepatic circulation. (Author)

**AD-625 526 Fld. 6/5**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE*
**DEFINITION AND OBJECTIVES OF THE CONFERENCE ON PHOSPHATES AND DENTAL CARIES,**
by Robert S. Harris. 1959, 3p.
Unclassified report

*Availability: Published in Journal of Dental Research v43 n6 pti p999-1001 Nov-Dec 1964. Copies to DDC users only.*

Descriptors: (*Phosphates, Teeth), (*Teeth, Diseases), Dentistry, Nutrition, Diet, Rodents, Symposia

**AD-625 527 Fld. 6/5, 6/15**
*UNIVERSITY OF WESTERN ONTARIO LONDON DEPT OF PHARMACOLOGY*
**BRAIN LESIONS AND HYPERBARIC OXYGEN CONVULSIONS,**
by Charles W. Gowdey, Yezdi J. Patel, and George W. Stavraky. 22 Jun 64, 8p.
Unclassified report

*Availability: Published in International Journal of Neuropsychiatry v1 n4 p318-24 1965. Copies to DDC users only.*

Descriptors: (*Convulsive disorders, Oxygen), (*Oxygen, Convulsive disorders), Electroencephalography, Central nervous system, Toxicity, Brain, Pressure, Pathology, Hypoxia, Thresholds (Physiology), Rats, Great Britain

The corpus callosum was severed aseptically in groups of young rats and they were left for 11, 21 or 37weeks before exposure to oxygen at high pressure (OHP). Rats were unanesthetized, placed individually in a small tank, compressed with oxygen to 60 p.s.i.g. and held there until 3 convulsions occurred, the stage-decompressed. Similar groups then underwnet a sham callotomy and were exposed at comparable times to OHP; other groups were unoperated but also exposed to OHP. The time of the first convulsion was not significantly different in the callotomy and sham callotomy rats on exposure to OHP in any of the groups. There were no appreciable differences in convulsibility or in EEG pattern when the rats were exposed repeatedly to OHP once a week for 6 weeks. Why corpus callotomy induces supersensitivity to the convulsions induced by pentylenetetrazol or hypoxia but not to OHP is not yet known. (Author)

**AD-624 873 See Fld. 6/13**

**AD-624 889 See Fld. 6/1**

**AD-624 899 See Fld. 12/1**

**AD-625 025 See Fld. 6/3**

**AD-625 256 See Fld. 6/13**

**AD-625 333 See Fld. 6/3**

**AD-625 342 See Fld. 6/16**

**AD-625 502 See Fld. 6/18**

**AD-625 631 See Fld. 6/13**

## 6/7. ESCAPE, RESCUE AND SURVIVAL

**AD-625 401 See Fld. 6/17**

## 6/8. FOOD

**AD-624 869 Fld. 6/8**
**CFSTI Prices: HC $4.00 MF $0.75**
*MIDWEST RESEARCH INST KANSAS CITY MO*
**OBJECTIVE TESTS FOR USE IN THE TECHNOLOGY OF COMPRESSED FOODS.**
Technical rept.,
by E. R. Morris. Sep 65, 109p. Contract DA-19-129-AMC-130(N) Proj. DA-1-K-6-43303-D-548 USA NLABS FD-26
Unclassified report

Descriptors: (*Dehydrated foods, Compressive properties), Chemical properties, Physical properties, Microbiology, Storage, Stability, Specifications, Freeze drying, Acceptability, Military rations, Moisture, Fats, Proteins, Carbohydrates, Additives, Tests

Objective methods are described for determining specific physical, chemical and microbiological properties of compressed food bars. The suitability of these methods was demonstrated by application to fresh and aged (3 months at 100F) bars prepared from meat, fruit, cereals, vegetables, and dairy products and which represented broad concentration ranges of moisture, fat, protein, carbohydrate, and common approved chemical additives. (Author)

**AD-624 994 Fld. 6/8, 6/18**
**CFSTI Prices: HC $3.00 MF $0.50**
*ARMY NATICK LABS MASS*
**STUDIES OF BEEF IRRADIATION FLAVOR USING A CONCURRENT RADIATION-DISTILLATION TECHNIQUE.**
Final technical rept. 1 May 63-30 Apr 65,
by E. L. Wick. Dec 65, 51p. Contract DA-19-129-AMC-99(N) Proj. DA-7X84-01-002 USA-NLABS FD-32
Unclassified report

Descriptors: (*Irradiated foods, Acceptability), Taste, Odors, Beef, Enzymes, Preparation, Distillation, Sensory perception, Tests, Aldehydes, Mass spectroscopy, Statistical analysis

Progress in the identification of beef components indispensable to the production of irradiation off-flavor is described. Evidence is presented that methional, n-nonanal, and phenylacetaldehyde are the major indispensable components. (Author)

**AD-625 252 Fld. 6/8, 6/18**
**CFSTI Prices: HC $2.00 MF $0.50**

*SWIFT AND CO CHICAGO ILL*
**DETERMINATION OF EQUIVALENCE BETWEEN RADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CURED MEATS.**
Technical rept.,
by R. A. Greenberg, B. O. Bladel, and W. J. Zingelmann. Oct 65, 30p. Contract DA-19-129-QM-2008 Proj. DA-7X84-01-002 USA-NLABS FD-28

Unclassified report

Descriptors: (*Clostridium botulinum, Meat), (*Radiation effects, Clostridium botulinum), (*Irradiated foods, Meat), Processing, Preservation, Pasteurization, Toxicity, Chemical analysis, Spores, Resistance (Biological), Toxins + antitoxins

Chopped ham, inoculated with spores of Clostridium botulinum strains 33A and 41B, was canned and subjected to an enzyme-inactivating heat pasteurization. The cans were then irradiated with 0.5, 1.5, 2.5, and 3.5 Mrads in the Natick cobalt-60 facility. A portion of the pack was not irradiated and received a commercial thermal process of Fo = 0.2. Toxic spoilage occurred in inoculated product at 0 and 0.5, but not at 1.5, 2.5, or 3.5 Mrad. Inoculum survivors were isolated from all product variables before and after six months incubation at 80100F. However, neither growth nor toxin was observed in unspoiled product. The 'injury' phenomenon previously described in thermally processed cured meats (survival of botulinal spores without capacity of outgrowth and/or toxinogenesis) apparently occurs also in irradiated cured meats. (Author)

**AD-625 483 Fld. 6/8, 6/18**
**CFSTI Prices: HC $2.00 MF $0.50**
*NEW YORK STATE AGRICULTURAL EXPERIMENT STATION GENEVA*
**A STUDY OF THE RADIATION-INDUCED SOFTENING OF PLANT TISSUES.**
Final rept., 1 Jun 60-31 Aug 62,
by Z. I. Kertesz, and L. M. Massey Jr.. Oct 65, 50p. Contract DA-19-129-qm-1584 Proj. DA-7-84-01-002 USA NLABS FD-27

Unclassified report

Descriptors: (*Fruits, Irradiated foods), (*Vegetables, Irradiated foods), (*Radiation effects, Plants (Botony)), Tissues (Biology), Radiological dosage, Gamma rays, Dose rate, Respiration, Carbon dioxide, Pectins, Degradation, Moisture, Carbohydrates, Storage

The radiation-induced changes in a large variety of fresh fruits and vegetables were investigated, and the physiology and biochemistry of some changes, particularly softening, investigated in detail. Possible beneficial results with several commodities, particularly apples, were noted. (Author)

**AD-625 484 Fld. 6/8**
**CFSTI Prices: HC $4.00 MF $1.00**
*WHIRLPOOL CORP ST JOSEPH MICH SYSTEMS DIV*
**EFFECT OF EXPOSURE TO OXYGEN ON CHANGES IN MEATS AND VEGETABLES DURING STORAGE.**
Final rept., 24 Jun 63-7 Jan 65,
by N. Roth, R. Wheaton, and P. Cope. Nov 65, 130p. Contract DA-19-129-AMC-131 Proj. DA-1K643303D548 USA NLABS FD-31

Unclassified report

Descriptors: (*Dehydrated foods, Storage), (*Oxidation, Dehydrated foods), Oxygen, Meat, Vegetables, Food, Freeze drying, Packaging, Moisture, Degradation, Nitrogen, Chemical analysis, Taste, Odors, Statistical analysis, Tables

Reported are the procedures and results of a six-months' storage stability study conducted with precooked beef, chicken, carrots and spinach which had been freezedried to 2 and 4% residual moisture levels and stored under 2, 4, and 20% oxygen atmosphere at 100F. Exposure to oxygen was the primary cause of product deterioration. The effect of residual moisture level and length of storage on quality attributes was product dependent. (Author)

## 6/11. LIFE SUPPORT

**AD-624 886 Fld. 6/11, 14/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*LITTLE (ARTHUR D) INC CAMBRIDGE MASS*
**STUDY AND DEVELOPMENT OF MATERIALS AND TECHNIQUES FOR PASSIVE THERMAL CONTROL OF FLEXIBLE EXTRAVEHICULAR SPACE GARMENTS.**
Final rept. Jul 64-Jun 65,
by David L. Richardson. Sep 65, 84p. Contract AF33 (615)-1904 Proj. AF-6373 Task 637302 AMRL TR-65-156

Unclassified report

Descriptors: (*Temperature control, Protective clothing), (*Protective clothing, Space environment conditions), Thermal conductivity, Thermal insulation, Helium, Heating

The program encompassed an analytical and experimental investigation of the application of passive thermal control techniques to extravehicular flexible space garments in 300 nautical mile earth orbits. Results indicate that passive thermal control by varying the absorptance and emittance of the outer surface of the garment is not possible when internal heat generated is in excess of 1500 Btu/hr. For all conditions, the suit's solar absorptance should be as small as possible and its emittance as large as possible. By controlling the conductance of the space suit wall, internal heating rates to 2000 Btu/hr are achievable when the space suit has an absorptance of 0.17 and an emittance of 0.85. A solar parasol with selected radiating properties on each side allows for higher internal heating rates. Experiments were made in a simulated noon orbit with a cylindrical section of a space suit which was first tested with an evacuated insulation and then with a helium-fillable insulation. The range of average conductance for these insulations was 0.3 to 4.0 Btu/sq ft hr F. A range of internal heat generation from 600 to 2100 Btu/hr was achieved when the evacuated insulation was filled with helium. (Author)

**AD-625 263 Fld. 6/11, 6/3, 6/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**LIFE SUPPORT SYSTEMS, PHOTOSYNTHESIS: ANALYTICAL SURVEY.**
Rept. no. 1 on ATD work assignment no. 22, pt. 14,
by Boris Nartsissov. 7 Dec 65, 80p. Rept. no. atd-65-107
TT 66-60058

Unclassified report

Contains a brief comprehensive survey (pt. 1) of the literature pub. in Soviet periodicals during 1964, and an annotated bibliography (pt. 2). Rept. on Surveys of Soviet Scientific and Technical Literature.

Descriptors: (*Life support, Photosynthesis), (*Photosynthesis, Bibliographies), Chlorophylls, Energy conversion, Organic pigments, Oxidation, Oxygen, Adsorption, Photosensitivity (Biological), Luminescence, Absorption spectrum, Fluorescence, Biosynthesis, Porphyrins, Pyridines, Plants (Botany), Abstracts, Indexes, State-of-the-art reviews, USSR

The annotated bibliography is focused on the following main points of interest: (1) Investigation of closely packed chlorophyll modifications in model systems (in adsorbed state). (2) Light conversion, energy transfer, photoexcitation of triplet states in tetrapyrrol pigments. (3) Intermediate reduced and oxidized forms of tetrapyrrol pigments. (4) Evolution of oxygen in photosynthesis. (5) Investigation of the structure of tetrapyrrol pigments. (6) Summaries at scientific meetings.

**AD-625 482 Fld. 6/11, 7/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*ISOMET CORP PALISADES PARK N J*
**DESIGN OF A TEST MODEL FOR A SOLID ELECTROLYTE CARBON DIOXIDE REDUCTION SYSTEM.**
Final technical rept. Mar-Dec 64,
by H. Chandler. Oct 65, 40p. Contract AF33 (657)-1498 Proj. AF-6373 Task 637302 AMRL TR-65-153

Unclassified report

Descriptors: (*Life support, Oxygen equipment), (*Carbon dioxide, Reduction (Chemistry)), Design, Space environmental conditions, Electrolysis, Oxygen, Carbon monoxide, Performance (Engineering), Acceleration, Vibration, Electrolytes, Zinc compounds, YHrium compounds, Oxides, Astronautics

A solid electrolyte carbon dioxide reduction system for use in a weightless condition on a planned suborbital missile flight was designed, fabricated, and tested. The system, which converted carbon dioxide to oxygen and carbon monoxide at a rate of 0.01 pounds per hour of carbon dioxide, weighed 39 pounds including all instrumentation and structural supports, occupied a volume of one cubic foot and consumed about 275 watts under steady state operating conditons. The system successfully passed specified acceleration and vibration tests and was delivered to the sponsoring agency for further use. (Author)

## 6/12. MEDICAL AND HOSPITAL EQUIPMENT AND SUPPLIES

**AD-625 416 Fld. 6/12, 6/16, 6/3, 14/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*IIT RESEARCH INST CHICAGO ILL*
**A NEW APPROACH TO STUDIES OF MUCUS FLOW AND CILIARY ACTIVITY.**
Final rept.,
by C. Jelleff Carr. 1965, 15p. Rept. no. iitri-L6022-2

Unclassified report

Descriptors: (*Trachea, Probes), (*Probes, Fiber optics), Medical equipment, In vitro analysis, In vivo analysis, Surgical techniques, Optical equipment, Photomicrography, Fluorescence, Particles, Particle size, Mucus, Motion, Illumination, Dogs, Rats

The report summarizes the work accomplished on a program to determine the feasibility of the use of fiber optics as a means of measuring ciliary activity in vivo. During the program, observation tubes were designed, produced, and implanted in the trachea of beagles. Both in vitro and in vivo tests were performed with a preliminary model of a fiber optics probe.

## 6/13. MICROBIOLOGY

**AD-624 873 Fld. 6/13, 6/5**
*JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MICROBIOLOGY*
**ANTIBODY-COMPLEMENT COMPLEXES,**
by William F. Willoughby, and Manfred M. Mayer. 17 Sep 65, 2p. Contract Nonr-248 (60) Grant ,NSF-GB-2597

Unclassified report

*Availability: Published in Science v150 n3698 p907-8 Nov 12 1965. Copies to DDC users only.*

Descriptors: (*Immunology, Complement), (*Complement, Hemolysis), Antigens + antibodies, Erythrocytes, Immune serums, Chromatographic analysis, Guinea pigs, Rabbits, Mammals

Soluble complexes containing the second and fourth components of guinea pig complement, as well as hemolytic rabbit antibody, have been prepared by elution from sheep erythrocytes carrying these factors. These complexes render erythrocytes susceptible to lysis by the other factors of guinea pig complement, without the usual requirements for hemolytic antibody, Ca (++), and Mg (++). (Author)

**AD-625 256 Fld. 6/13, 6/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**RECOVERY OF SPECIFIC MICROORGANISMS FROM URINE AND FECES OF INFECTED ANIMALS,**
by Richard H. Kruse, and Arnold G. Wedum.
Nov 65, 50p. Rept. no. miscellaneous Publication-12
Proj. DA-1C622401A072

Unclassified report

Descriptors: (*Microorganisms, Excretion), (*Laboratory animals, Infections), (*Biological laboratories, Safety), Urine, Diseases, Etiology, Scientific personnel, Indexes, Tables

Prevention of occupationally acquired laboratory infection among experimenters and animal caretakers is easier when it is known if the microorganisms under study are excreted in the urine and/or feces of the experimental animal. Appropriate precautionary procedures can then be established. This preliminary report lists 351 references to 56 diseases; human laboratory infections of 43 of the diseases have occurred. The table shows whether the etiologic agent has been recovered, or could not be recovered, from the urine and/or feces of man and various domestic and laboratory animals. (Author)

**AD-625 608 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**STIMULATION OF TYPHOID AGGLUTININS UNDER THE INFLUENCE OF THE EV PLAGUE VACCINE,**
by Z. N. Prkhodoko, and V. A. Romanov. Jun 65, 3p. Rept. no. translation-1381
TT 66-60098

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n11 p145 1964.

Descriptors: (*Salmonella, Agglutinins), (*Pasteurella, Vaccines), Diseases, Immunity, Antigens + antibodies, Stimulation, Rabbits, USSR

The aim of the work was to clear up the stimulating influence of killed plague vaccine of the EV strain on the formation of typhoid agglutinins in rabbits. In the test 12 rabbits weighing 2 - 2.5 kg were used.

**AD-625 611 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**THE COMPATIBILITY OF ANTHRAX STI VACCINE IN ASSOCIATION WITH PLAGUE TULAREMIA AND BRUCELLOSIS VACCINES,**
by V. G. Piopenko, and M. A. Miroshnichenko.
Jun 65, 12p. Rept. no. translation-1402
TT 66-60100

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v40 n3 p27-31 1963.

Descriptors: (*Bacillus anthracis, Vaccines), (*Vaccines, Effectiveness), Pasteurella, Brucella, Immunity, Antigens + antibodies, Guinea pigs, USSR

A mixture of plague, tularemia and brucella vaccines were inoculated simultaneously (on a separate skin area) with the STI anthrax vaccine to guinea pigs. In such a combination of the four live antigens the STI vaccine lost its immunogenicity greatly. This effect was absent if the STI vaccine was inoculated 15, 10, 8, 6 days before the immunization with a complex of the rest three live vaccines. Depression of the anthrax antigen followed not only a simultaneous inoculation of the three other vaccines, but also of any two of these components. The STI vaccine by itself had no depressive effect on the immunological efficacy of the plague, tularemia and brucella vaccines. (Author)

**AD-625 616 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**THE POSSIBILITY OF USING B PRODIGIOSUM AS AN EXPERIMENTAL BACTERIAL AEROSOL MODEL,**
by V. V. Vlodavets. Jun 65, 9p. Rept. no. translation-1372
TT 66-60105

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) n11 p65-8 1964.

Descriptors: (*Bacterial aerosols, Serratia marcescens), (*Serratia marcescens, Bacterial aerosols), Stability, Viability, Humidity, Temperature, Staphylococcus, USSR

The utilization of B. prodigiosum (strain No. 20-10) as an experimental model of an aerosol is not expedient due to their exceedingly rapid dying off at low indices of humidity, weak stability under the conditions of an air medium and the emergence of pigment variants. These microorganism may be used for the purposes of experimental aerobiology only with an air humidity greater than 60%. There are specific advantages in using aerosols of Staphylococcus albus, which possesses a greater stability. (Author)

**AD-625 617 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY ARMOR BOARD FORT KNOX KY*
**NITROGENOUS SUBSTANCE CHANGES IN THE NUTRITIVE BROTHS PREPARED FROM THE DRY KPD PREPARATION FOLLOWING CULTURING OF CL. BOTULINUM OF THE A, B, C AND E TYPES,**
by L. G. Ivanova, and T. I. Sergeyeva. Jun 65, 13p. Rept. no. translation-1390
TT 66-60106

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) n1 p101-8 1964.

Descriptors: (*Clostridium botulinum, Culture media), Organic nitrogen compounds, Toxins + antitoxins, Amino acids, Amines, Peptones, Tryptophan, USSR

By using the standard medium prepared from the dry KPD preparation a study was made of the changes of chemical indices of nitrogenous substances in this medium resulting from the growth of and toxin formation by C1. botulinum of the A, B, C and E types. As demonstrated, the quantity of nitrogenous substances of the medium (amine nitrogen, peptone, tryptophane and of some other amino acids) changes characteristically for each of the Cl. botulinum types and in accordance with the extent of its proteolytic intensity. Amine nitrogen content increases in growing Cl. botulinum of the A and B types 3-fold, of the C types – 2-fold, and of the E type - 1 1/2 times. The peptone level in the medium also goes down inversely to the amine nitrogen content. Trytophane completely disappears while culturing A and B types, is halved in the growing of the C type and remains almost unchanged with the type E. (Author)

**AD-625 620 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**APPLICATION OF ANTIBOTULINUM ALIZARIN SUSPENSION AGGLUTININS FOR THE RAPID DETECTION OF THE BOTULISM CAUSATIVE AGENT,**
by A. K. Adamov, T. I. Bulatova, and A. G. Shvarts. Jun 65, 10p. Rept. no. translation-1380
TT 66-60107

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n10 p66-70 1964.

Descriptors: (*Clostridium botulinum, Identification), Biological stains, Agglutinins, Antigen-antibody reactions, Immune serums, Food, Diagnosis, USSR

Botulism causative agents may be detected with the help of the agglomeration reaction of alizarin suspension agglutinins in a concentration equal to 12.5 – 100 million in 1 ml. The agglomeration reaction of antibotulinum alizarin suspension agglutinins is strictly specific and makes it possible to differentiate the botulism causative agent from Bac. sporogenes and also other species of microbes. The agglomeration reaction of suspension agglutinins is not suppressed by alien microflora and may be utilized for the rapid detection of botulism causative agents in mixed cultures. With the help of alizarin suspension agglutinins the botulism causative agents can be detected in food product in an average of 18 - 29 hours. (Author)

**AD-625 623 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**BIOLOGICAL PROPERTIES OF THE NIIEG TULAREMIA VACCINE STRAINS,**
by L. V. Sirotyuk. Jun 65, 8p. Rept. no. translation-1368
TT 66-60109

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n10 p116-20 1964.

Descriptors: (*Pasteurella, Vaccines), Viability, Immunity, Effectiveness, Production, Storage, Culture media, Guinea pigs, Mice, USSR

The NIIEG vaccine tularemia strains No. 10, 33 and 53 practically preserved all their biological characteristics in the process of a 10-year storage in a dried state (in saccharose-gelatin medium). The NIIEG vaccine strains No. 10 and 53 are harmless for guinea pigs and highly immunogenic in tests on white mice and guinea pigs, but possess an increased residual virulence for white mice in comparison with the standard Gayskiy No. 15 strain. The NIIEG vaccine strains No. 10 and 53, based both on their biological properties disclosed at the present time as well as in a test on their wide application in the past, may be recommended as reserves for the production of live tularemia vaccine. The NIIEG vaccine strain No. 33, based on agglutinability and immunogenic properties, is inferior to the other strains and cannot be recommended for the production of live vaccine. (Author)

**AD-625 628 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**STUDY OF THE ABILITY OF ENTERIC BACTERIA TO INFECT THE AIR OF HOSPITAL WARDS,**
by O. S. Grishina. Jun 65, 4p. Rept. no. translation-1382
TT 66-60114

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n11 p139-40 1964.

Descriptors: (*Enterobacteriaceae, Hospitals), (*Hospitals, Enterobacteriaceae), Infec-

tions, Air, Children, Escherichia coli, Salmonella, Dysentery, USSR

The aim of the investigation was to study the ability to infect the air of hospital wards by fecal saprophytic and pathogenic flora, especially enteropathogenic E. coli and also dysenteric bacteria and Salmonella. The investigation was carried out in a period when intrahospital outbreaks of any diseases were not registered, but there were mildly focal infections with colienteritis in the children's sections. (Author)

**AD-625 629 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**PROPERTIES OF CULTURES OF ANTHRAX BACILLI GROWN AT VARIOUS TEMPERATURES,**
by I. F. Batyuk, S. S. Dyachenko, A. A. Bogomoletsand , and I. P. Alekseienko. 1965, 8p. Rept. no. translation-1367
TT 66-60115

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v27 n1 p19-22 1956.

Descriptors: (*Bacillus anthracis, Culture media), Spores, Morphology (Biology), Biochemistry, Viability, Immunity, USSR

The formation of spores was observed in a culture of anthrax bacilli at 43C. Therefore, the incubation of anthrax cultures at the stated temperature is not considered to be a completely satisfactory method for obtaining anthrax strains. By incubating a culture of anthrax bacilli in meat-peptone chicken broth with a pH = 7.1 - 7.2 at 45C, it was established that under these conditions they do not transform from the vegetative form into the spore form. During this the morphological, cultural and biochemical properties of the culture did not change. In a culture obtained following incubation of a virulent strain of the anthrax causative agent in broth at 45I for 7 days, a low virulence was combined with high immunizing properties -- after a single inoculation an intense immunity set-in in the animals.

**AD-625 630 Fld. 6/13**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**A NEW VARIETY OF PLAGUE MICROBE,**
by M. I. Levi, Yu. V. Kanatov, and L. A. Sagatovskaya. 1965, 31p. Rept. no. translation no. 1026
TT 66-60116

Unclassified report

Trans. of Gosudarstvennyi Nauchno-Issledovatelskii Protivochumnyi Institut, Rostov-on-Don. Trudy (USSR) v18 p3-23 1961.

Descriptors: (*Pasteurella, Diseases), (*Disease vectors, Pasteurella), Rodents, Infections, Viability, Culture media, Classification, Epidemiology, Siphonaptera, Immune serums, USSR

In recent years in the Armenian SSR and the MNR acute epizootics were registered in various species of voles, and the isolated strains of plague bacteria displayed a striking resemblance to each other in relation to glycerin, nitrates, rhamnose, and urea, and also a mild virulence for guinea pigs. Strain 1260, isolated in 1959 in the Armenian SSR, was subjected to a detailed study in experiments on some wild and laboratory animals, during which a number of differences were detected between it and strains isolated from other rodents. During subcutaneous infection, strain 1260 turned out to be mildly pathogenic for midday gerbils, little susliks, guinea pigs, and white rats, and displayed a high virulence for white mice and common voles in which individual cases a prolonged bacteremia emerged. There are sufficient grounds for acknowledgement of the independence of the vole variety of the plague causative agent. A classification of the varieties of the plague microbe is cited. Apparently, several species of voles play the role of primary vectors of the plague causative agent and together with their fleas under favorable conditions are capable of supporting its multiplication and development in a countless number of generations. (Author)

**AD-625 631 Fld. 6/13, 6/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**IMMUNOLOGICAL ACTIVITY OF LYMPHOID ORGANS DURING AEROSOL AND SUBCUTANIOUS TYPHOID IMMUNIZATION,**
by N. I. Aleksandrov, N. E. Gefen, N. B. Egorovaand , and I. V. Miroshnichenke. Jun 65, 10p. Rept. no. translation-1373
TT 66-60117

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n11 p128-33 1964.

Descriptors: (*Salmonella, Vaccines), (*Lymphatic system, Immunity), (*Immunity, Salmonella), Antigens + antibodies, Ribonucleic acids, Lymphocytes, Injection (Medicine), Aerosols, Agglutinins, Serodiagnosis, Rabbits, USSR

The single aerosol and subcutaneous immunization of rabbits with typhoid whole antigen caused an intensive plasmocytic reaction, expressed in a considerable increase in the number of young plasmatic cells both in the regional and distant lymph nodes. In the rabbits, both during the aerosol and subcutaneous immunization, the number of RNA enriched lymphocytes increased in the peripheral blood. The increase of the titer of typhoid agglutinins in the regional lymph nodes in rabbits vaccinated by the aerosol and subcutaneous methods began with the 3rd day following immunization and reached the maximum by the 10th day. In the first days following immunization the titers of agglutinins in the blood serum were somewhat lower than in the homogenates of the regional lymph nodes; however they became considerably higher in later periods. The double aerosol immunization caused an active plasmocytic reaction in the regional and distant lymph nodes which set in earlier than following the single immunization. In the investigations conducted an expressed correlation was detected in the level of plasmocytic reaction, accumulation of RNA in the lymphocytes of the peripheral blood and the serological shifts in rabbits, subjected to subcutaneous and aerosol immunization with typhoid vaccine.

**AD-625 632 Fld. 6/13**
**CFSTI Prices: HC $7.00 MF $1.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**QUESTIONS IN THE EPIDEMIOLOGY AND PROPHYLAXIS OF TULAREMIA,**
by N. G. Olsufyev, B. N. Pastukhov, and V. V. Kucheruk. Mar 64, 325p. Rept. no. translation 1038
TT 66-60118

Unclassified report

Trans. of Mono. Voprosy Epidemiologii i Profilaktiki Tulyaremii, Moscow, 1958 187p.

Descriptors: (*Pasteurella, Epidemiology), Diseases, Ecology, Disease vectors, Mammals, Rats, Ticks, Diptera, Infections, Vaccines, Effectiveness, Immunity, Diagnosis, Public health, USSR

The report contains the successful experience in the treatment and cure of tularemia in the northern part of the Volga-Akhtuba floodplain in the construction zone of the Stalingrad Hydroelectric Station (where before the beginning of the construction cases of tularemia had been repeatedly observed). Along with this, a detailed epidemiological description has been given of the natural tularemia focus which has been studied in detail by the authors and also its landscape, parasitological and epizootological features. The collection gives the data of the experimental study of tularemia on different vertebrates which inhabit the studied focus, treats the role of them as sources of infection, and also gives data on studying the carriers and, first of all, ticks. Results are also discussed of the measures leading to a reduction in the morbidity of tularemia and the treatment of the natural foci of the infection. Particular attention has been given to the questions concerning the effectiveness of vaccination against tularemia, and in particular data have been given on the extensive use of the skin tularin for determining the stratum of the population which is immune to tularemia. An appendix is given for a complex plan of anti-tularemia measures which has been compiled on the basis of the experience from the scientific-practical work which has been done. (Author)

**AD-625 642 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**MACROPHAGE CULTURES PREPARED IN VITRO AND A MORPHOLOGICAL STUDY OF THEIR CELLULAR ELEMENTS,**
by T. N. Maslova. Jun 65, 10p. Rept. no. 1388
TT 66-60122

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v40 p98-102 1963.

Descriptors: (*Phagocytes, Tissue culture), In vitro analysis, Reticulo-endothelial system, Body fluids, Morphology (Biology), Tissue culture cells, Cytochemistry, Polysaccharides, Fats, Guinea pigs, USSR

A study was made of the possibility of obtaining the macrophage culture in vitro from the guinea pig aseptic exudates. As demonstrated, the cellular elements of aseptic exudates (monocytes, lymphocytes and histocytes), being attached to the slides immersed into the liquid nutritive medium, multiplied and underwent corrsponding morphological transformations described in detail in this work. (Author)

**AD-625 645 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**ANTIGENIC STRUCTURE OF THE BAC. ANTHRACIS VACCINAL STRAIN,**
by E. N. Levina, and L. N. Kats. 1964, 11p. Rept. no. 1369
TT 66-60124

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n10 85-8 1964.

Descriptors: (*Bacillus anthracis, Antigens + antibodies), (*Antigens + antibodies, Cytochemistry), Cells, Fluorescent antibody technique, Pepsins, Trypsin, Peptides, Polysaccharides, Chymotrypsin, Muramidase, Hyaluronate lyase, Proteins, USSR

Antigens of the vaccine strain of Bac. anthracis are localized in the capsule and cell membrane. In the composition of these structures it is possible to isolate three antigenic complexes having definite localization in the cell and possessing varied properties. The surface antigens of the capsule, the localization of which it is possible to determine in the cell with the aid of capsular fluorescent serum, are sensitive to the action of pepsin and partially trypsin and evidently are peptides. The capsular antigens proper are located in the principal layer of the capsule and are revealed both by capsular and membrane sera; they contain substances of a protein-polysaccharide nature, sensitive to the action of trypsin, chymotrypsin, hyaluronidase and lysozyme. Antigens of the cell membrane, exposed with the aid of membrane luminescent serum, contain substances sensitive to the action of lysozyme and trypsin of both a polysaccharide and protein nature. (Author)

**AD-625 647 Fld. 6/13, 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**NATURAL TULAREMIA FOCI ON THE TERRITORY OF THE UKRAINIAN SSR,**
by V. M. Stupnitskaya, M. P. Marinov, E. F. Litvinenko, V. V. Slesarenko, and A. S. Slesarenko.
Jun 65, 10p. Rept. no. translation-1365
TT 66-60125
Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n10 p94-8 1964.

Descriptors: (*Pasteurella, USSR), (*Disease vectors, Pasteurella), Ticks, Rodents, Humans, Mortality rates, Ecology, Diseases, Epidemiology, Public health

**AD-625 651 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**A STUDY OF IMMUNOGENESIS FOLLOWING VACCINATION WITH THE LIVE ASSOCIATED VACCINE. REPORT I. A STUDY OF IMMUNOGENESIS IN GUINEA PIGS VACCINATED WITH BRUCELLOSIS AND ANTHRAX VACCINE,**
by E. A. Gubina, and M. I. Chernysheva. Jun 65, 10p. Rept. no. translation-1366
TT 66-60126
Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n10 p3-7 1964.

Descriptors: (*Brucella, Vaccines), (*Bacillus anthracis, Vaccines), (*Vaccines, Effectiveness), Immunity, Reticulo-endothelial system, Guinea pigs, USSR

During the simultaneous administration of brucellosis and anthrax vaccine, a reciprocal reaction of the organism developed in sequence: At first to anthrax, then to the brucellosis vaccine. Immunogenesis for the STI vaccine, when it is administered simultaneously with brucellosis vaccine, proceeds basically according to the type of reaction to anthrax monovaccine. During the study of immunogenesis for brucellosis vaccine when it is administered simultaneously with anthrax vaccine, facts are exposed verifying the inhibiting action of the anthrax component: (a) the vaccine culture Br. abortus 19-BA populated the organism of the guinea pig less intensively than during the administration of monovaccine; (b) the vaccine process was characterized by a weak reciprocal reaction on the part of reticuloendothelium elements. (Author)

**AD-625 655 Fld. 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**FREEING THE AIR OF MICROFLORA UNDER THE ACTION OF ARTIFICIAL AEROIONIZATION,**
by L. D. Boiko, and A. N. Sverchknov. Jun 65, 4p. TT 66-60128
Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n11 p142-3 1964.

Descriptors: (*Air, Purification), (*Microorganisms, Air), Staphylococcus aureus, Culture media, Growth, Inhibition, Ionization, USSR

**AD-625 657 Fld. 6/13, 6/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**OMSK HEMORRHAGIC FEVER INCIDENCE IN MAN AND MUSKRATS IN WINTER,**
by T. N. Fedorova, and G. A. Sizemova. 1964, 8p. Rept. no. translation-1371
TT 66-60129
Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n11 p134-6 1964.

Descriptors: (*Virus diseases, USSR), (*Disease vectors, Virus diseases), Ticks, Rodents, Epidemiology, Etiology, Hemorrhage, Fevers, Antigens ; antibodies, Diagnosis, Tissue culture, Serodiagnosis

**AD-624 960** **See Fld. 6/1**

**AD-625 025** **See Fld. 6/3**

**AD-625 473** **See Fld. 6/1**

**AD-625 615** **See Fld. 15/2**

**AD-625 626** **See Fld. 6/1**

**AD-625 633** **See Fld. 6/3**

## 6/15. PHARMACOLOGY

**AD-625 435 Fld. 6/15, 15/2**
*DEFENCE CHEMICAL BIOLOGICAL AND RADIATION LABS OTTAWA (ONTARIO)*
**PENETRATION OF GUINEA PIG AND RABBIT SKIN BY DIMETHYL SULFOXIDE SOLUTIONS OF A QUATERNARY OXIME,**
by H. L. McDermot, G. W. Murray, and R. M. Heggie. 12 Mar 65, 4p.
Unclassified report

*Availability: Published in Canadian Journal of Physiology and Pharmacology v43 p845-8 1965. Copies to DDC users only.*

Descriptors: (*Sarin, Countermeasures), (*Skin, Permeability), (*Sulfoxides, Penetration), Oximes, Poisoning, Cholinesterase inhibitors, Atropine, Dosage, Blood plasma, Thresholds (Physiology), Guinea pigs, Rabbits, Canada

Dimethyl sulfoxide (DMSO) penetrates skin readily and has been reported to promote the passage of chemicals through human skin. The data presented show that DMSO will promote the penetration of the clipped skin of the guinea pig or rabbit by a quaternary salt, 1-methyl-2hydroximino methylpyridinium methane sulfonate (P2S), to produce plasma levels that are effective in protecting animals against poisoning by the anticholinesterase sarin (isopropyl methyl phosphonofluoridate).

**AD-625 508 Fld. 6/15, 6/16**
*TORONTO UNIV (ONTARIO) DEPT OF PHYSIOLOGY*
**THE EFFECT OF TOLBUTAMIDE (RASTINON) ON THE LEVELS OF GLUCOSE AND INORGANIC PHOSPHORUS OF BLOOD IN NORMOTHERMIC AND HYPOTHERMIC RATS,**
by Anne L. Crawford, and R. E. Haist. 18 Mar 65, 7p.
Unclassified report

*Availability: Published in Canadian Journal of Physiology and Pharmacology v43 p825-31 1965. Copies to DDC users only.*

Descriptors: (*Drugs, Hypothermia), (*Hypothermia, Blood chemistry), (*Hypoglycemia, Hypothermia), Blood, Glucose, Phosphorus, Hematocrit, Body temperature, Dosage, Rats, Canada

Blood sugar, inorganic phosphorus, and hematocrit values were measured in normothermic and hypothermic (25C) fasted rats injected intra-arterially with tolbutamide (Rastinon) and a control solution. Doses of 12.5, 25, 50, and 100 mg/kg body weight of tolbutamide led to hypoglycemia in the normothermic rats, whereas doses of 25 and 200 mg/kg tolbutamide had no effect on the blood sugar levels of hypothermic rats. Doses of 25, 50, 100, and 200 mg/kg caused the blood inorganic phosphorus levels to fall, and in the so-called 'normothermic' rats the colonic temperature was reduced. A dose of 200 mg/kg injected intra-arterially led to a fall in the inorganic phosphorus levels of blood in hypothermic rats. (Author)

**AD-624 953** **See Fld. 7/3**

**AD-625 521** **See Fld. 6/5**

**AD-625 524** **See Fld. 7/4**

**AD-625 527** **See Fld. 6/5**

## 6/16. PHYSIOLOGY

**AD-625 282 Fld. 6/16**
*PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY*
**LUMINANCE, PURITY AND WAVELENGTH MATCHES OF CONTRAST COLORS,**
by John Lott Brown, and Howard B. Ranken. 13 Jan 65, 12p. Contract Nonr-551 (49) Grant, PHS-SF-277
Unclassified report

Prepared in cooperation with Purdue Univ., Lafayette, Ind. Dept. of Psychology.

*Availability: Published in Vision Research v5 p443-53 1965. Copies to DDC users only.*

Descriptors: (*Color vision, Measurement), Luminescence, Spectra (Visible + ultraviolet), Colorimetry, Light, Colors, Adaptation (Physiology), Visual perception, Eye, Calibration, Frequency

Contrast colors induced in a central 'white' area by surrounding inducing colors were matched in the contralateral eye. Results are presented in terms of luninance, wavelength of a spectral component, and colorimetric purity of the match as well as in C. I. E. values. A relation between colorimetric purity of the match and saturation of the inducing color is indicated. A neutral region in C. I. E. color space is roughly defined which differs from the locus of the 'white' component employed in the experiment. (Author)

**AD-625 342 Fld. 6/16, 6/5**
*LYON UNIV (FRANCE) LABORATOIRE DE PATHOLOGIE EXPERIMENTALE*
**L'ACTIVITE ELECTRIQUE PHASIQUE DU CORTEX ET DU THALAMUS AU COURS DU SOMMEIL DESYNCHRONISE CHEZ LE CHAT (PHASIC ELECTRICAL ACTIVITY OF THE CORTEX AND OF THE THALAMUS DURING DESYNCHRONIZED SLEEP OF THE CAT),**
by J. A. Hobson, and M. Jouvet. 1964, 5p. Contract AF-EOAR-62-67 AFOSR 65-2252
Unclassified report

Text in French.

*Availability: Published in Societe de Biologie Comptes rendus des seances v158 n11 p2131-2136 1964. Copies to DDC users only.*

Descriptors: (*Sleep, Electrophysiology), (*Cerebral cortex, Sleep), Vision, Thalamus, Nervous system, Stimulation, Cats, France

**AD-625 494 Fld. 6/16, 6/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*RESEARCH FOUNDATION FOR MENTAL HYGIENE NEW YORK*
**RESEARCH ON THE METABOLISM OF GLUTATHIONE, GLUTAMINE, AND RELATED COMPOUNDS.**
Final rept. 1 Aug 61-31 Jul 65,
by Heinrich Waelsch, and Amos Neidle. 31 Jul 65, 15p. Contract Nonr-3407 (00) Proj. NR-108-069
Unclassified report

Descriptors: (*Glutathione, Metabolism), (*Glutamine, Metabolism), Carboxylic acids, Glutamic acid, Central nervous system, Aspartic acid, Carbon dioxide, Toxicity, Brain, Nerves, Ammonia, Enzymes, Immunity, Antigens ; antibodies, Hemoglobin, Amines, Peptides, Labeled substances, Synthesis, Radioactivity, Vertebrates, Invertebrates, Crustacea, Amphibians, Acetylcholine, Physotigmine, Curare alkaloids, Citric acids, Histones, Neoplasms, Ribonucleic acids, Rabbits, Cats

Compartmentation of these amino acids and other Krebs cycle intermediates in the brain under normal conditions and in the presence of toxic levels of ammonia was investigated. The importance of carbon dioxide fixation in maintaining physiological levels of the dicarboxylic acids was indicated by these studies. Experiments on the incorporation of C14 labeled CO2 confirmed and extended these findings. Results pointing to the functional significance of CO2 fixation in brain and nerve are presented. Also presented are experiments relating to the specificity and biological function of the enzyme transglutaminase. Other research summarized in this report concerns the structure and metabolism of nucleohistones, RNA polymerase in brain, and various aspects of amino acid and protein metabolism. (Author)

**AD-625 520 Fld. 6/16**
*TORONTO UNIV (ONTARIO) DEPT OF PHYSIOLOGY*
**THE INACTIVATION OF ANTITHROMBIN BY ETHER: EVIDENCE AGAINST THE EXISTENCE OF ANTITHROMBIN IV,**
by Frank C. Monkhouse, and Susan Milojevic.
22 Apr 65, 5p. Contract DRB-9310-32
Unclassified report

*Availability: Published in Canadian Journal of Physiology and Pharmacology v43 p819-23 1965. Copies to DDC users only.*

Descriptors: (*Thrombin, Blood plasma), Blood coagulation, Ethers, Heparin, Prothrombin, Fibrinogen, Enzymes, Electrophoresis, Dogs, Canada

Citrated defibrinated dog plasma was washed with ether to remove normal antithrombin. At least three washes with three volumes of ether for each wash were required to remove all antithrombin activity. Heparincofactor activity was also removed by this treatment. When the prothrombin of this ether-treated plasma was activated, the thrombin activity remained stable in the mixture for several hours. This is in contrast to activated normal plasma, in which the thrombin activity disappears within a few minutes because of the antithrombin content. By adding purified antithrombin to ether-treated plasma, a normal thrombin generation curve was obtained. It has been concluded that there is only one enzymatic antithrombin in plasma. (Author)

**AD-625 523 Fld. 6/16**
*TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS*
**THE CELLULAR BASIS OF THE GENETICALLY DETERMINED HEMOPOIETIC DEFECT IN ANEMIC MICE OF GENOTYPE S1/S1 (D),**
by E. A. McCulloch, L. Siminovitch, J. E. Till, E. S. Russell, and S. E. Bernstein. 25 Nov 64, 12p. Contract AT (30-1)-1800 Grant ,PHS-HD-0254
Unclassified report

*Availability: Published in Blood, the Journal of Hematology v26 n4 p399-410 Oct 1965. Copies to DDC users only.*

Descriptors: (*Hemopoietic system, Genetics), (*Genetics, Hemopoietic system), (*Anemias, Genetics), Blood cells, Blood diseases, Hematology, Spleen, Bone marrow, Tissue extracts, Growth, Transplantation, Radiation effects, Parabiosis, Histology, In vitro analysis, Canada

The proliferation and function of hemopoietic cells derived from genetically anemic Sl/sl (d) mice have been studied by the use of cell transplantation technics. It was found that marrow cells derived from anemic Sl/Sl (d) or Sl (d)/Sl (d) mice, when implanted into heavily irradiated mice of genotype +sl/+sl, are capable of forming macroscopic spleen colonies, with approximately the same frequency as cells derived from normal +sl/+sl mice. Marrow cells derived from Sl/Sl (d) animals were tested for their capacity to cure the anemia of W/W (v) mice and were found to implant as rapidly and to have as long-lasting a beneficial effect as did marrow cells from +sl/+sl mice. The radiosensitivity of the colony-forming ability of marrow cells from Sl/Sl (d) mice was found to be similar to that found previously for +sl/+sl marrow cells, although the anemic animals are known to be more sensitive to totalbody irradiation than are their normal littermates. Marrow cells from +sl/+sl mice were found to proliferate more slowly in irradiated mice of genotype Sl/Sl (d) than in irradiated +sl/+sl littermates, even when the anemic and the normal mice were joined in parabiosis. These observations indicate that the hemopoietic colonyforming cells in mice of genotype Sl/Sl (d) are normal, but fail to function adequately because the tissues of mice of this genotype are unable to provide sufficient support for proliferation and differentiation of these progenitor cells. (Author)

**AD-625 528 Fld. 6/16, 5/10**
*MANITOBA UNIV WINNIPEG*
**AUDITORY SENSITIVITY AFTER PROLONGED VISUAL DEPRIVATION,**
by P. D. Duda, and J. P. Zubek. 1965, 2p. Contract NRC-APT-106 ,DRB-9425-08
Unclassified report

*Availability: Published in Psychon. Sci. v3 p359-60 1965. Copies to DDC users only.*

Descriptors: (*Vision, Sensory deprivation), (*Sensory deprivation, Auditory acuity), Hearing, Thresholds (Physiology), Auditory perception, Audiofrequency, Adaptation (Physiology), Sensitivity, Stimulation, Audiometry, Statistical analysis, Canada

Ss who were placed in darkness for a week but otherwise were exposed to a normal and varied sensory environment showed a significant increase in auditory flutter fusion frequency. This effect was still present one day after the termination of visual deprivation. The absolute threshold of hearing for five frequencies was not affected. (Author)

**AD-624 990 See Fld. 6/5**

**AD-625 279 See Fld. 6/5**

**AD-625 416 See Fld. 6/12**

**AD-625 422 See Fld. 5/10**

**AD-625 508 See Fld. 6/15**

## 6/17. PROTECTIVE EQUIPMENT

**AD-625 401 Fld. 6/17, 6/7**
**CFSTI Prices: HC $3.00 MF $0.75**
*SAN ANTONIO AIR MATERIEL AREA KELLY AFB TEX*
**MINUTES OF THE PERSONAL EQUIPMENT ADVISORY GROUP MEETING HELD 11-12 OCT 1965 AT ATLANTIC CITY, NEW JERSEY.**
1965, 72p.
Unclassified report

Descriptors: (*Air force equipment, Survival), (*Survival, Air force equipment), Eyeglasses, Safety devices, Flashblindness, Flares, Safety harness, Survival kits, Protective clothing, Exposure, Life rafts, Distress signals, Radio beacons, Air-sea rescues, Air-sea rescue beacons, Radio equipment, Actuators, Parachutes, Ejection, Sleeping bags, Helmets, Symposia

## 6/18. RADIOBIOLOGY

**AD-624 917 Fld. 6/18**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**THE SEQUENCE OF EVENTS IN RADIATION CARCINOGENESIS: A UNIFYING FORMULATION,**
by Leonard J. Cole, and Peter C. Nowell. 2 Nov 65, 30p. Rept. no. usnrdl-TR-930
Proj. MR005.08-1200 NAVMED MR005.08-1200-2
Unclassified report

Descriptors: (*Cancer, Radiation sickness), (*Radiation sickness, Cancer), Radiation hazards, Mutations, Cells (Biology), Radiation effects

First, one or more specific mutations are produced in the target cell, either directly or through an indirect mechanism, viral or otherwise. Tumor development begins when the altered cell, having survived the mutating event, is brought into mitosis by a specific or nonspecific proliferative stimulus. Subsequent tumor progression results from repeated additional mutations in the tumor cells with sequential clonal selection from the altered population. Considerations of radiation carcinogenesis in experimental animals, and presumably in man as well, must include the effects of total dose, dose rate and quality of radiation on mutagenesis, and on the survival of mutated cells; and the effects and interactions of both mutagenic and nonmutagenic agents (including viruses, hormones, other environmental factors, and radiation itself) on subsequent tumor development. It is concluded that the complex interplay of many factors and mechanisms--indirect as well as direct--in radiation carcinogenesis makes a simple dose-response relationship untenable. (Author)

**AD-624 934 Fld. 6/18**
**CFSTI Prices: HC $1.00 MF $0.50**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**EFFECT OF IONIZING RADIATION ON ANIMALS AND PLANTS,**
by Janice L. Smith. 8 Dec 65, 22p. Rept. no. atd-65-110
TT 65-64828
Unclassified report

Trans. from Akademiya Nauk SSSR. Institut Genetiki. Trudy, v32 1965.

Descriptors: (*Radiobiology, Abstracts), (*Animals, Radiation effects), (*Plants (Botany), Radiation effects), Gamma rays, X rays, Neutrons, Metabolism, Seeds, Ethylenimines, Embryos, Chlorophylls, Mutations, Proteins, Mammals, Blood, Testes, Aging (Physiology), Reproductive system, Tissues (Biology), Pathology, Estrogens, Adrenal cortex, Amines, Chromosomes, Liver, Mice

Contents: Effect of cellular metabolic regulators on gamma-irradiated barley seed; Effect of cultivation conditions and maturity on gamma-irradiated barley; Effect of ethylenimine on neutron-irradiated barley; Embryonic selection and chlorophyll mutation in irradiated barley; Protein metabolism disturbances in animals exposed to X-rays; Radiosensitivity of various mammalian strains and species; Radiosensitivity of peripheral blood in various animal genotypes; Damage to testes of mice irradiated in embryo; RBE based on testicular damage and dominant lethal gamete mutations in mice; Age and radiosensitivity in mice; Testicular radiosensitivity in newborn mice; Reactivity of various types of tissue to irradiation and diethylstilbestrol in mice; Effect of a chemical protector (CO) on survival and internal pathology in mice exposed to X-rays; Effect of estrogens and radiation on adrenal catechol amine metabolism; Chemical protection of rabbit spermatazoa from genetic radiation damage; Effect of ionizing radiation on adrenal cortex function in mice.

**AD-625 359 Fld. 6/18**
**CFSTI Prices: HC $5.00 MF $1.00**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**DISINTEGRATION RATE MULTIPLIERS IN BETAEMITTER DOSE CALCULATIONS.**
Final rept.,
by Stephen L. Brown. Aug 65, 174p. Contract N228(62479)65702 Proj. SRI-MU-5116 Task 3119A

Unclassified report

Descriptors: (*Dose rate, Beta particles), (*Beta particles, Radiological dosage), Radiation hazards, Half life, Geometry, Absorption (Biological), Radioactive fallout, Shielding, Animals, Insects, Whole body irradiation

The calculation is described of beta disintegration rate multipliers, which when multiplied by the disintegration rate per unit area for a given radionuclide give the beta dose rates in tissue for contact dose and beta bath geometries. Results are given for nearly 400 betaemitting radionuclides and a comparison is made with simpler models of beta dose distribution. The conclusion is reached that beta doses can represent a hazard in comparison to those from gamma radiation when sensitive tissues are found at relatively shallow depths in the exposed organism. (Author)

**AD-625 502 Fld. 6/18, 6/5**
*TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS*
**RADIOSENSITIVITY OF THE IMMUNE RESPONSE TO SHEEP RED CELLS IN THE MOUSE, AS MEASURED BY THE HEMOLYTIC PLAQUE METHOD,**
by J. C. Kennedy, J. E. Till, L. Siminovitch, and E. A. McCulloch. 23 Sep 64, 9p. Contract DRB-9350-14 ,MA-1420

Unclassified report

Prepared in cooperation with the Ontario Cancer Inst., Toronto.

*Availability: Published in the Journal of Immunology v94 n5 p715-22 1965. Copies to DDC users only.*

Descriptors: (*Radiation effects, Immunity), (*Antigens + antibodies, Radiation effects), Immunology, Radiobiology, Mammals, Erythrocytes, Mice, Hemolysis, Gamma rays, Sensitivity, Parenteral infusions, Spleen, Canada

Gamma-ray survival curves have been obtained for the capacity of adult male mice to respond to the injection of sheep erythrocytes by the production of hemolytic plaque-forming cells. When antigen was given within 2 hr after irradiation of the mice, the survival curve was found to be a simple negative exponential, with a D37 of 80 rads. No significant change in this curve was found when an interval of 10 days separated radiation and antigen injection, indicating that radiation-induced damage to the immune system was not repaired during this interval. The capacity of plaque-forming cells to form plaques was found to be much less sensitive to radiation than was the capacity of the animals to produce plaque-forming cells. No decrease in the capacity of plaque-forming cells to form plaques was found for doses of radiation up to 2 kilorads. On the basis of these survival curves, it is suggested that the spleens of normal mice contain a minimum of 1,000 cells which do not themselves produce hemolysin, but respond to the injection of antigen by proliferation and differentiation into hemolysin-producing cells. Further, when these cells, which may be termed antigen-sensitive cells, are rendered incapable of proliferation by radiation they are not replaced to a significant degree for a period of at least 10 days. (Author)

**AD-624 994 See Fld. 6/8**

**AD-625 252 See Fld. 6/8**

**AD-625 483 See Fld. 6/8**

## 6/19. STRESS PHYSIOLOGY

**AD-625 254 Fld. 6/19**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT*
**CINERADIOGRAPHIC OBSERVATIONS OF HUMAN SUBJECTS DURING TRANSVERSE ACCELERATIONS OF +5GX AND +10GX.**
Final rept.,
by Harold Sandler. 21 Oct 65, 17p. Rept. no. nadc-MR-6501

Unclassified report

Descriptors: (*Heart, Acceleration tolerance), (*Acceleration tolerance, Heart), X-ray photography Motion pictures, Thorax, Stress (Physiology), Humans, Radiography

X-ray motion pictures were recorded for five human subjects during transverse accelerations of +5Gx and +10Gx on the Johnsville centrifuge. Quantitative measurements of change in A-P chest diameter and heart position were made from photographic prints of the films. A slight but significant posterior displacement of heart position could be demonstrated when compared to change in the A-P chest diameter. (Author)

**AD-625 266 Fld. 6/19**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA*
**VISUAL LOCALIZATION OF THE HORIZONTAL AS A FUNCTION OF BODY TILT UP TO = 90 DEGREES FROM GRAVITATIONAL VERTICAL,**
by Earl F. Miller,II, Alfred R. Fregly, Gert van den Brink, and Ashton Graybiel. 3 Aug 65, 29p. Rept. no. nsam-942
Contract NASA Order-R-47 NAVMED MR005.13-6001.1-118

Unclassified report

Descriptors: (*Posture, Visual perception), (*Visual perception, Posture), Space perception, Body, Illusions, Vestibular apparatus, Psychophysiology, Errors, Training, Tests

The visual horizontal was determined for three sophisticated subjects tilted laterally in 10 degrees intervals within =90 degrees from gravitational vertical. The task had adequate intratest reliability, but there were considerable interest and intrasubject quantitative variations. Visual localization as a function of body tilt, however, was qualitatively similar among all subjects and among the thirteen test sessions of each subject. Around upright there was a range (totaling 20 - 40 degrees on the average) of body positions in which the deviation was not significant from that of upright. Inclinations beyond this range caused the E-phenomenon to appear and increase bilaterally up to a maximum of about the 40 - 50 degrees position; with further inclination the deviation reversed direction and passed through the position (60 - 80 degrees) of zero deviation to grow as the A-phenomenon. Responses were bilaterally symmetrical in certain respects for each of the subjects. The variable error among all subjects followed a similar (curvilinear) function of body attitude. Repetition of test without immediate knowledge of results did not as a rule end in reduction of errors. (Author)

**AD-625 323 Fld. 6/19**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA*
**OTOLITH ORGAN ACTIVITY WITHIN EARTH STANDARD, ONE-HALF STANDARD, AND ZERO GRAVITY ENVIRONMENTS.**
Joint rept.,
by Earl F. Miller,II, Ashton Graybiel, and Robert S. Kellogg. 4 Aug 65, 17p. Contract NASA Order-R-93 NAVMED MR005-13-6001-119

Unclassified report

Descriptors: (*Vestibular apparatus, Weightlessness), Ear, Eye, Rotation, Nystagmus, Gravity, Acceleration, Deafness, Semicircular canals, Astronauts, Motion sickness, Stress (Physiology), Space medicine

Six individuals with bilateral labyrinthine defects and seven normal persons served as subjects. Transient periods of subgravity force (0.5G, zero G) were produced by parabolic flight maneuvers in a specially equipped C-131B aircraft which accommodated a tilt chair and accessory apparatus for recording ocular counterrolling response to body tilt (=25 degrees, =50 degrees). Testing under 1.0G conditions was accomplished during periods of straight and level flight. The labyrinthinedefective (L-D) group revelaed results which were qualitively similar to those from the normal group but markedly reduced in magnitude. This demonstrated that extra-labyrinthine factors were not significantly influencing extraocular muscle tonus, and therefore ocular counterrolling served as a valid and sensitive indicator of otolith activity under hypogravic conditions. In the normal subjects zero G induced a physiological deafferentation of the otolith organs as indicated by the lack of any significant counterrolling response when the subjects were tilted righward or leftward up to 50 degrees. When the gravitational force equalled approximately 0.5G, the magnitude of counterrolling fell substantially below the level midway between the zero and Earth standard gravity response curves. The nonlinear relationship between otolith activity and subgravity force that is implied in these data and confirmed in a follow-up study is discussed. (Author)

**AD-625 434 Fld. 6/19**
*DEFENCE RESEARCH MEDICAL LABS TORONTO(ONTARIO)*
**THEORETICAL ASPECTS OF THE ROLE OF ANGULAR ACCELERATION IN VESTIBULAR STIMULATION.**
Research paper,
by R. S. Weaver. 1965, 37p. Rept. no. drml-RP-565

Unclassified report

*Availability: Published in Acta Oto-Laryngologica Suppl. 205 p5-36 Stockholm 1965. Copies to DDC users only.*

Descriptors: (*Acceleration, Vestibular apparatus), (*Vestibular apparatus, Acceleration), Equations of motion, Semicircular canals, Rotation, Velocity, Ear, Vector analysis, Canada

Equations of motion are applied to the human vestibular apparatus when undergoing movement. Typical turntable experiments are considered, and the physical effects of the associated motions are analyzed, with special emphasis on the forces experienced by the semicircular canals. In appendices to the report, vector algebra is developed, and equations of motion are derived in vector form. Graphs and a nomograph for evaluation of the results of centrifugal acceleration are presented in another appendix.

**AD-625 525 Fld. 6/19, 5/10**
*NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y*
**PERCEPTUAL VERTIGO: A DIMENSIONAL STUDY.**
Technical rept.,
by Robert C. Benfari. 9 Mar 64, 7p. Rept. no. navtradevcen-IH-11

Unclassified report

*Availability: Published in Perceptual and Motor Skills v18 p633-9 1964. Copies to DDC users only.*

Descriptors: (*Vertigo, Visual perception), (*Motion sickness, Visual perception), Stimulation, Flight simulators, Motion pictures,

Space perception, Illusions, Adaptation (Physiology)

Nine Ss were used in an experiment to determine the effects of peripheral flicker and the degree of structure of the stimulus field upon the incidence and degree of vertigo. The groups of Ss were defined as: (a) Susceptible, (b) Non-susceptible, and (c) a highlytrained Aviator group. Visual presentation of the stimuli was accomplished by means of a hemispherical scene and a wide-angle lens system. Ss' verbal responses were recorded and analyzed. The groups responded with a greater degree of vertiginous response to the stimuli of peripheral flicker in a field of low structure. (Author)

## 7/1. CHEMICAL ENGINEERING

**AD-625 570 Fld. 7/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*DAYTON UNIV OHIO RESEARCH INST*
**COMPARISON OF TRANSIENT COMPRESSORS FOR THE PRODUCTION OF HIGH TEMPERATURE AND HIGH DENSITY GASES.**
Final scientific rept. 15 Jun 63-30 Jun 65,
by John E. Minardi. Sep 65, 59p. Contract AF33 (657)-8975 Proj. AF-7116 Task 711601 ARL 65-181

Unclassified report

Descriptors: (*Compressors, Feasibility studies), (*Gases, Production), Systems engineering, Density, High-temperature research, Pressure, Pistons, Shock tubes

Research on systems for the production of high temperature and high density gases was conducted to determine the feasibility of various compressors to produce such gases. The report gives a comparison of the various systems that were studied and suggests systems that show promise of yielding greatly improved operation over systems presently available. Also reported is additional theory and data on membrane pistons used in conjunction with tapered tubes and data obtained with a ,NDEM Staged Piston System. (Author)

**AD-625 092** **See Fld. 11/9**

## 7/2. INORGANIC CHEMISTRY

**AD-624 928 Fld. 7/2, 21/9**
**CFSTI Prices: HC $3.00 MF $0.50**
*AMERICAN OIL CO WHITING IND RESEARCH AND DEVELOPMENT DEPT*
**THE FO RADICAL AND PRESSURE REACTIONS OF N2F2.**
Quarter rept. no. 11, 1 Aug-1 Nov 65.
Nov 65, 54p. Rept. no. m65-265
Contract DA-31-124-ARO (D)-78 ,ARPA Order-402 Proj. ARO-D-4135C Task 3

Unclassified report

Descriptors: (*Oxidizers, Chemical properties), (*Oxygen compounds, Fluorides), (*Nitrogen compounds, Fluorides), (*Fluorine compounds, Azines), Photochemistry, Free radicals, Phosphorescence, Band spectrum, Absorption spectrum, Mass spectroscopy, Electrolysis, Synthesis (Chemistry), Complex compounds, Paramagnetic resonance

Efforts to generate gaseous OF centered upon flash photolysis of CF3COOF at low temperature. Two transient phenomena were found: at 77K violet phosphorescence from the solid and at higher temperature two diffuse adsorption bands from the gas. Because the phosphorescence is observed from the solid of several fluorocarbonyl compounds, the phosphor is likely an impurity excited by energy transfer from the host lattice. For electrolytic generation of OF2 from wet HF, ohmic overvoltage at the nickel anode was determined by both potential decay and superimposed square wave. The ohmic overvoltage at normal electrolysis conditions was surprisingly low (0.25 to 0.40 v. at 4.8 v. anode). Work continued on the structure of N2F2 complexes. Solutions of N2F2 in SbF5, blue when fresh but rapidly fading to yellow, were examined by electron paramagnetic resonance to determine if the color arises from free radicals. An EPR spectrum of the yellow solution could be resolved into two separate spectra. The sixteen-line spectrum is consistent with the SbF5 (-) radical while the five-line spectrum arises from an N2 containing radical of as yet unknown composition.

**AD-624 975 Fld. 7/2, 7/3**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)*
**DEVELOPMENTS IN ANALYTICAL CHEMIS TRY AT NRC,**
by D. S. Russell. 1965, 3p. Rept. no. nrc-8644

Unclassified report

*Availability: Published in Chemistry in Canada Aug 1965. Copies to DDC users only.*

Descriptors: (*Chemical analysis, Canada), Chromatographic analysis, Quantitative analysis, Gas analysis, Infrared spectroscopy, Emissivity, Impurities, Labeled substances

**AD-624 988 Fld. 7/2, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)*
**TRANSITION-METAL CARBON CHEMISTRY.**
Summary rept. Nov 62-Nov 63,
by G. Wilkinson. Sep 65, 11p. Contract AF-EOAR-62-55 Proj. AF-7342 Task 734201
ML TDR-64-135

Unclassified report

Descriptors: (*Complex compounds, Synthesis (Chemistry)), (*Halogenated hydrocarbons, Complex compounds), Alkynes, Fluorine compounds, Dienes, Ketones, Benzenes, Molecular structure, Stereochemistry, X-ray diffraction analysis, Transition elements, Carbon compounds, Rhodium compounds

The use of hexafluorobut-2-yne for the preparation of inorganic complex compounds was investigated. Compounds were prepared which are complexes of tetrakis (trifluoromethyl) cyclopentadienone and hexakis (trifluoromethyl) benzene. They were studied chemically and also structurally by X-ray diffraction. (Author)

**AD-624 989 Fld. 7/2, 20/12, 9/1**
*AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO*
**ANALYSIS OF THIN FILMS OF TANTALUM REACTIVELY SPUTTERED IN NITROGEN ATMOSPHERE.**
Technical rept.,
by E. A. Buvinger. 16 Apr 65, 4p. Rept. no. AFAL-TR-65-269

Unclassified report

*Availability: Published in Applied Physics Letters V7 N1 P14-5 1 July 1965. Copies to DDC users only.*

Descriptors: (*Films, Tantalum), (*Tantalum compounds, Nitrides), (*Molecular structure, Tantalum compounds), Electron diffraction analysis, Synthesis (Chemistry), Sputtering, Nitrogen, Controlled atmospheres

**AD-625 045 Fld. 7/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF CHEMISTRY*
**INFRARED SPECTRA OF POLYATOMIC HIGH TEMPERATURE MOLECULES.**
Final scientific rept.,
by O. Schnepp. 1 Aug 65, 14p. Contract AF61 (052)-824 AFML 65-420

Unclassified report

Descriptors: (*Lithium compounds, Spectra (Infrared)), (*Polyatomic molecules, Spectra (Infrared)), (*Halides, Spectra (Infrared)), (*Infrared spectroscopy, Polyatomic molecules), Fluorides, Chlorides, Absorption spectrum, Band spectrum, Solidified gases, Helium group gases, Vapors, Chemical bonds, Vibration, Israel

The far infrared absorption spectra of lithium chloride and lithium fluoride vaporization species trapped in inert solids at liquid hydrogen temperature were investigated. The spectral range 650/cm to 140/cm were covered. The out-of-plane bending vibration of the dimer was assigned for both halides investigated. Additional absorptions were observed and their assignments are discussed. Two absorptions were observed for lithium fluoride which give isotopic substitution patterns characteristic of trimer bands. (Author)

**AD-625 077 Fld. 7/2, 21/9, 7/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER*
**DETERMINATION OF THE STRUCTURE OF 03F2.**
Final technical rept. 1 Oct 61-30 Sep 64,
by Richard G. Maguire. 2 Jun 65, 99p. Rept. no. iitri-C206-13
Contract AF49 (638)-1091 Proj. AF-9750, IITRI-C206 Task 37501
AFOSR 65-1731

Unclassified report

Descriptors: (*Oxidizers, Molecular structure), (*Oxygen compounds, Fluorides), (*Fluorides, Molecular structure), Surface tension, Viscosity, Dielectric properties, Magnetic properties, Magnetic moments, Paramagnetic resonance, Nuclear magnetic resonance, Spectra (Infrared)

The objective of this program was to study the molecular structure of trioxygen difluoride, O3F2. To accomplish this objective the following properties were measured: surface tension, viscosity, dielectric constant, paramagnetic susceptibility, specific susceptibility, molar magnetic moment, electron paramagnetic resonance, nuclear magnetic resonance, and infrared spectra. The structure of O3F2 is not clearly defined. There is evidence to support the presence of O2F and OF radicals. There is evidence to support the possibility that O3F2 is a trimer at least in the liquid state. O3F2 is not a compound of ozone. A linear molecular configuration is not possible. (Author)

**AD-625 146 Fld. 7/2, 20/12, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PROBLEMS OF SEMICONDUCTOR CHEMISTRY,**
by A. V. Novoselova. 8 Dec 65, 16p. Rept. no. ftd-TT-65-1056
TT 66-60007

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Vestnik v34 n8 p71-6 1964.

Descriptors: (*Semiconductors, Chemistry), Synthesis (Chemistry), Single crystals, Phase studies, Crystal growth, Chemical bonds, Crystal lattices, Electrochemistry, Electrical conductance, Thermal conductivity, USSR

Topics include: synthesis of crystalline inorganic semiconductor materials; nature of the chemical bond in semiconductors; obtaining semiconductors with pre-determined properties; semiconductors not of the sphalerite crystallochemical group.

**AD-625 191 Fld. 7/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*AUBURN UNIV ALA*
**A STUDY OF THE DECOMPOSITION MECHANISM OF AMMONIUM PERCHLORATE.**

Quarterly rept. no. 1, 1 Jun-30 Sep 65,
by James E. Land. 30 Sep 65, 17p. Contract DA-01-021-AMC-12346 (Z)

Unclassified report

Descriptors: (*Ammonium compounds, Perchlorates), (*Perchlorates, Decomposition), Reaction kinetics, Catalyts, Temperature, Data, Pyrolysis, Explosion effects

The research is concerned with the study of the chemical changes that occur during the decomposition of ammonium perchlorate (hereinafter abbreviated AP) produced by the application of heat. To follow the exoand endothermic changes which are produced when AP is heated from ambient temperature to approximately 450C., the technique of differential thermal analysis (DTA) is used. Interest is centered at present on the effect of various catalytic agents on the mechanism of AP decomposition. During the period of this report efforts continued with the making of DTA runs at various heating rates on AP samples to which had been added various materials to test the catalytic effect of these additives.

**AD-625 307 Fld. 7/2, 7/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*MONSANTO RESEARCH CORP DAYTON OHIO*
**STUDIES OF LOW-TEMPERATURE OXIDATION REACTIONS.**
Annual progress rept. no. 3, 1 Oct 64-30 Sep 65,
by L. Parts, and J. T. Miller Jr.. 6 Dec 65, 60p. Contract Nonr-3977 (00)

Unclassified report

See also AD-609 800.

Descriptors: (*Cryogenics, Chemical reactions), (*Oxidation, Low-temperature research), (*Nitrogen compounds, Synthesis (Chemistry)), (*Fluorine compounds, Synthesis (Chemistry)), Nitrates, Spectra (Infrared), Crystal structure, Alkenes, Nitration, Aldehydes, Anhydrides, Oxides, Hydrazine derivatives, Metalorganic compounds, Fluorination, Fluoroamines, Oxidizers

Nitrosonium nitrate, NO (+)NO3 (-), is formed upon the oxidation of nitric oxide in certain hydrocarbon solutions at cryogenic temperatures. The infrared spectrum of this compound was studied at temperatures ranging from 79 to 205K. Low-temperature (77 - 90K) oxidative nitration of isobutylene and subsequent oxidation of the unstable product with N2O4 at 273K yield 2-nitratoisobutyraldehyde and 2-nitratoisobutyric anhydride. Nitrosonium nitrate may be transitory intermediate in the reaction of N2O4 with olefins at about 273K. Tetrafluorohydrazine was found to react with a number of inorganic and organometalloid compounds. Most of these reactions occur only above 243K. This suggests that the difluoramino radical, present in equilibrium with tetrafluorohydrazine in this temperature range, is the reactive species.

**AD-625 008** **See Fld. 7/4**

**AD-625 096** **See Fld. 20/13**

**AD-625 175** **See Fld. 7/4**

**AD-625 257** **See Fld. 11/6**

**AD-625 482** **See Fld. 6/11**

**AD-625 513** **See Fld. 19/8**

**AD-625 591** **See Fld. 20/9**

## 7/3. ORGANIC CHEMISTRY

**AD-624 875 Fld. 7/3, 7/4**
**CFSTI Prices: HC $3.00 MF $0.50**
**OXIDATIVE STUDIES OF POLYPHENOLS.**
Final technical rept, 1 Jun 61-31 May 64,
by John E. Wertz, and John W. Thomas. 1 Oct 65, 53p. Contract DA-ARO (D)-31-124-G112 AROD 3153:1

Unclassified report

Descriptors: (*Phenols, Oxidation), (*Quinones, Oxidation), Polycyclic compounds, Electrolysis, Electron spin resonance, Free radicals, Chemical bonds, Protons, Titanium, Ions, Aluminum compounds, Chlorides, Boron compounds, Fluorides

The primary purpose was to apply electrolytic techniques to quinone and hydroquinone systems to help elucidate the autoxidation process for the latter. Special conditions must be observed to detect free radicals formed by electrolytic oxidation of hydroquinones, but quinones are readily reduced to semiquinones in a number to solvents; seldom did subsidiary lines appear in the spectra that cannot be attributed to a semiquinone. Evidence is presented that variation of proton splitting constants for semiquinones is due primarily to H bonding in protic solvents. Investigation of the system of diprotonated semiquinone cations in concentrated H2SO4 showed that some quinones are apparently reduced to di-protonated semiquinone cations in 96-98% H2SO4, i.e. no additional reducing agent is necessary. The reaction of trivalent titanium ion with H202 was used to generate primary radicals that can be used to abstract H atoms from organic molecules, thereby generating free radicals that would be difficult to produce otherwise. Preliminary observations are made on the free radicals formed from quinones and the Lewis acids aluminum chloride and boron trifluoride.

**AD-624 953 Fld. 7/3, 6/15**
*ATLANTIC REGIONAL LAB HALIFAX (NOVA SCOTIA)*
**THE STRUCTURE OF BOSTRYCOIDIN, A BETA-AZAANTHRAQUINONE FROM FUSARIUM SOLANI D2 PURPLE.**
by G. P. Arsenault. 16 Aug 65, 7p.

Unclassified report

*Availability: Published in Tetrahedron Letters, n45 p4033-7 1965. Copies to DDC users only.*

Descriptors: (*Antibiotics, Molecular structure), (*Organic pigments, Molecular structure), (*Anthrones, Molecular structure), Fusarium, Polycyclic compounds, Quinones, Spectra (Visible ; ultraviolet), Spectra (Infrared), Nuclear magnetic resonance, Biosynthesis, Canada

**AD-625 035 Fld. 7/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*PITTSBURGH UNIV PA DEPT OF CHEMISTRY*
**THE REACTIONS OF 2- AND 4-PICOLINE N-OXIDES WITH PHENYLACETIC ANHYDRIDE.**
by Theodore Cohen, and John H. Fager. 1965, 43p. Contract AF-AFOSR-344-63

Unclassified report

Presented in part at the International Congress of Pure and Applied Chemistry (19th), London, July 1963.

Descriptors: (*Pyridines, Chemical reactions), (*N-heterocyclic compounds, Chemical reactions), Oxides, Aromatic compounds, Anhydrides, Oxidationreduction reactions, Acetates

The reactions of 2- and 4-picoline N-oxide with phenylacetic anhydride yield the oxidation-reduction products, benzaldehyde, carbon dioxide, picolines and small quantities of diphenylmaleic anhydride (XII), in addition to rearrangement products. The latter consist predominatly of 2-pyridinemethanol phenylacetate (X) and 2-phenylethylpyridine (XI) in the case of 2-picoline N-oxide and of 4-pyridinemethanol phenylacetate (XIV) and 4-phenylethylpyridine (XV) in the case of 4-picoline N-oxide. The product composition is unchanged when the reactions are performed in the presence of the radical trap m-dinitrobenzene. The rearrangement but not the oxidation products are thought to arise via the anhydrobase intermediates XIX and XX. The ester products in this case and in the corresponding acetic anhydride reactions are thought to be formed by non-radical paths while the phenylethylpyridines are probably formed by geminate recombination of benzyl and picolyl radicals which are produced by fragmentation of the anhydrobases XIX and XX. (Author)

**AD-625 057 Fld. 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**POLAROGRAPHIC DETERMINATION OF ACROLEIN IN THE OXIDATION PRODUCTS OF PROPYLENE ON COPPER CATALYSTS,**
by V. P. Latyshev, and N. I. Popova. 17 Dec 65, 9p. Rept. no. ftd-TT-65-446
TT 65-64841

Unclassified report

Unedited rough draft trans. of mono. Teoriya i Praktika Polyarograficheskogo Analiza, Kishinev, 1962 p406-8.

Descriptors: (*Polarographic analysis, Acroleins), (*Acroleins, Polarographic analysis), (*Propenes, Oxidation), Catalysts, Copper, Spectroscopy, Quantitative analysis, Polymers, Concentration (Chemistry), Bromides, USSR

A detailed investigation was made for the purpose of revealing the degree of influence of admixtures of carbonyl compounds on the height of the polarographic halfwave of acrolein in the products of oxidation of propylene on a copper catalyst, and there is given an evaluation of the precision of three quantative methods.

**AD-625 080 Fld. 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*STANFORD UNIV CALIF*
**FACTORS INVOLVED IN THE STABILITY OF CYCLOPROPANES.**
Final technical rept. 1 Oct 61-15 Sep 65,
by R. H. Eastman. 15 Sep 65, 14p. Contract AF49 (638)-1272 AFOSR 65-1793

Unclassified report

Descriptors: (*Stereochemistry, Cyclopropanes), (*Cyclopropanes, Stability), Molecular isomerism, Cycloalkenes, Benzenes, Terpenes, Ketones, Photochemistry, Thermochemistry, Chemical equilibrium

Research accomplishments in the following areas summarized: valence isomerization in the bicyclo/3.1.O/hexene system; steric relationship between the cyclopropane and benzene rings; steric mechanisms in the isomerization of trans-2-thujene and the reduction of dihydroumbellolone; synthesis of cyclic ketones which easily undergo photode-carbonylation in solution; mechanisms involved in a ring-chain, anhydride-diacid equilibrium. A list of publications containing detailed reports of the investigations is included.

**AD-625 121 Fld. 7/3**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB*
**SUBSTITUTED PERINAPHTHENYL ANION RADICALS.**
Physical sciences research papers,
by Tapan K. Mukherjee, and Aleksandar Golubovic. 18 Jan 65, 14p. Rept. no. psrp-160
Proj. AF-8659 Task 865901
AFCRL 65-810

Unclassified report

*Availability: Published in Journal of Organic Chemistry v30 p3166-9 Sep 1965. Copies to DDC users only.*

Descriptors: (*Polycyclic compounds, Free radicals), (*Free radicals, Polycyclic compounds), Nitriles, Acetamides, Synthesis (Chemistry), Ions, Electron spin resonance, Dehydrogenation, Oxidation-reduction reactions

2,3-Dihydroperinaphthen-delta (1-alpha)-malononitrile, 2,3-dihydroperinaphthen-delta (1-alpha)-ethyl cyanoacetate, and 2-3-dihydroperinaphthen-delta (1-alpha)-cyanoacetamide were synthesized. Organic bases catalyze the dehydrogenation of these compounds to the corresponding cyanomethylene perinaphthenes. The anion radical of perinaphthen-delta (1-alpha)-malononitrile was obtained by reaction with metallic sodium in tetrahydrofuran (THF). Its e.s.r. spectrum closely resembles that of radicals generated during the dehydrogenation reaction, for which a mechanism involving electron-transfer steps is proposed. (Author)

**AD-625 125 Fld. 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*BATTELLE MEMORIAL INST COLUMBUS OHIO*
**AN INFRARED STUDY OF POLYFLUORINATED AROMATICS IN THE LOW-FREQUENCY REGION.**
Summary technical rept. Jun 64-Jun 65,
by R. J. Jakobsen. Oct 65, 21p. Rept. no. g-6918 Contract AF33 (615)-1706 Proj. AF-7367 Task 736702
ML TR-65-289

Unclassified report

Descriptors: (*Aromatic compounds, Spectra (Infrared)), (*Halogenated hydrocarbons, Spectra (Infrared)), (*Fluorine compounds, Aromatic compounds), (*Infrared spectroscopy, Halogenated hydrocarbons), Benzenes, Chlorine compounds, Stereochemistry, Band spectrum, Chemical analysis

By use of the inequality rule and comparison with chlorobenzenes, the out-of-plane CF deformations of a series of unsubstituted fluorobenzenes were assigned. Tentative assignments were also made for the in-plane CF deformations. The CF deformations of a series of substituted pentafluorobenzenes were assigned and were shown to correlate with the frequencies of the unsubstituted pentafluorobenzenes. While it is not possible to use only one band for identification of ring substitution (as in the case of using CH deformations), the entire pattern of CF deformations can be used for analytical purposes. (Author)

**AD-625 176 Fld. 7/3, 20/2, 11/1**
*FLORIDA STATE UNIV TALLAHASSEE DEPT OF CHEMISTRY*
**X-RAY DIFFRACTION STUDIES OF THE MELTING OF LINEAR POLYETHYLENE,**
by C. H. Baker, and L. Mandelkern. 12 Nov 64, 3p. AROD 4222:5

Unclassified report

*Availability: Published in Polymer Letters v3 p339-41 1965. Copies to DDC users only.*

Descriptors: (*Polyethylene plastics, Melting), (*X-ray diffraction analysis, Polyethylene plastics), Linear systems, Crystallography

From studies of the x-ray scattering diagrams of linear polyethylene (Marlex-50) as a function of temperature, Stuart (1) has concluded that a diffuse halo can be produced without melting. In particular, the diagrams upon which Stuart bases his claim show that an appreciable halo is present at 110C. This halo intensifies with increasing temperature with a corresponding decrease occurring in the intensities of the (110) and (200) crystalline reflections. These reflections completely vanish at 130C.; this temperature being significantly lower than the melting temperature measured by thermodynamic methods (1,2). The results of x-ray scattering measurements as a function of temperature on Marlex-50 samples crystallized in different ways are reported. Measurements were made using a Norelco diffractometer with Ni filtered CuKalpha radiation. Samples were contained in a specially constructed holder which enabled the x-ray diffraction patterns to be studied as a function of temperature. Before examination each sample was subjected to a specific crystallization procedure, after having been molded in a frame which could be slotted into the sample holder. The crystallization procedures adopted were as follows: (a) crystallization in vacuo at 130C. for 15 days; (b) cooling while the sample was in the molding press (but under no applied pressure) from above 160C. to room temperature over a period of 5 hr.; and (c) rapid quenching by immersion of a sample initially at 160C. into an icewater mixture. The densities produced in the samples by these procedures were 0.981, 0.964 and 0.943 g./ml. respectively as determined by the gradient column technique at 25C.

**AD-625 177 Fld. 7/3**
*FLORIDA STATE UNIV TALLAHASSEE DEPT OF CHEMISTRY*
**A CALORIMETRIC STUDY OF THE FUSION OF MOLECULAR WEIGHT FRACTIONS OF LINEAR POLYETHYLENE,**
by L. Mandelkern, J. C. Fatou, R. Denison, and J. Justin. 9 Mar 65, 5p. AROD 4222:6

Unclassified report

Prepared in cooperation with Perkin-Elmer Corp., Norwalk, Conn.

*Availability: Published in Polymer Letters v3 p803-7 1965. Copies to DDC users only.*

Descriptors: (*Polyethylene plastics, Heat of fusion), Calorimetry, Molecular weight, Melting, Volume, Density

The work encompasses a molecular weight range from 1.25x10,000 to 1.47x 1,000,000. Prior to the onset of the fusion measurements, the samples were isothermally crystallized from the melt at 130C. for a sufficient length of time so that essentially no further crystallization occurred at this temperature. The samples were then cooled to room temperature over a 24-hr. period. The results of the measurements are summarized for six different molecular weights in samples heated at the rate of 10/min. from room temperature to 430K. A major endotherm, characteristic of melting, is observed in each case. Most of the samples also display a very small but definite endothermic peak occurring at a lower temperature. The melting temperature of the sample, taken at the maximum of the major endotherm, is strongly dependent on the heating rate employed. When an extremely rapid heating rate is employed, as for example 80/min., apparent melting temperatures are found in the range 152-157C. Calibration of the instrument for this high heating rate indicates that an error of 8-9 greater than the true temperature of the sample is possible. Melting would thus be in the range 143-148C., demonstrating that crystalline polyethylene can be easily superheated when desired.

**AD-625 218 Fld. 7/3, 8/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS*
**THE PHOTOCHEMICAL SYNTHESIS OF POLYAZACYCLOBUTANE SYSTEMS.**
Final rept., 15 Nov 63-31 Aug 65,
by Michael P. Cava. 8 Nov 65, 13p. Contract DA-ARO (D)-31-124-G392 Proj. RF 1552 AROD 3631:1

Unclassified report

Descriptors: (*Cyclobutanes, Synthesis (Chemistry)), (*N-heterocyclic compounds, Synthesis (Chemistry)), (*Polyclclic compounds, Synthesis (Chemistry)), Photochemistry, Organic sulfur compounds, Decomposition, Ultraviolet radiation

Nineteen Schiff bases, both acyclic and cyclic, were prepared in order to study their behavior on ultraviolet irradiation (a) in the solid state and (b) in solution, (c) both in the presence and absence of oxygen and (d) with and without a Pyrex filter. Most of the Schiff bases were found to be remarkably stable to ultraviolet light and only the starting materials could be isolated. (On prolonged irradiation, dark brown tarry products were also formed.) In contrast, irradiation of the Schiff base formed from 1-naphthaldehyde and 1-naphthyl amine gave dibenzo /c,k/ phenanthridine; similarly, the Schiff base from 1-naphthaldehyde and toluidine gave the analogous phenanthridine. 1,2,5Naphtho /b/ thiadiazole was synthesized and photolyzed in the hope that 1,2-diazanaphtho /b/ cyclobutadiene might be produced, but photodimerization of the thiadiazole was the only reaction observed. Finally, a new photolytic decomposition of benzylic sulfones was discovered and investigated in detail. (Author)

**AD-625 397 Fld. 7/3, 19/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS FORT BELVOIR VA*
**FULMINATES: A LITERATURE SURVEY.**
by Hyman Rosenwasser. Oct 65, 27p. Rept. no. aerdl-1833
Proj. AERDL-1C014501A32B Task 1C014501A32B-01

Unclassified report

Descriptors: (*Fulminates, Reviews), (*Explosive materials, Fulminates), Free radicals, O-heterocyclic compounds, N-heterocyclic compounds, Synthesis (Chemistry), Complex compounds, Metalorganic compounds, Solubility, Pyrolysis, Chemical analysis, Nitriles, Oxides

Among the aspects discussed in this survey are the preparation of fulminic acid and its polymerization behavior, as well as its application for the synthesis of compounds such as the isoxazoles. Progress in the synthesis of fulminate salts leads from mercuric fulminate to other metallic fulminates, to complexes, and to organometallic derivatives. Studies dealing with structure, solubility, thermal decomposition, and analysis of fulminates are presented. (Author)

**AD-625 414 Fld. 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*PITTSBURGH UNIV PA*
**DEOXYGENATION REACTIONS OF AMINE OXIDES AND SULFOXIDES.**
Completed project summary,
by Theodore Cohen. 1965, 14p. Contract AF49 (638)-788 Grant ,AF-AFOSR-344-63 AFOSR 65-1729

Unclassified report

See also AD-419 928, AD-613 851, AD-614 718.

Descriptors: (*Oxidation-reduction reactions, Organic compounds), (*Organic nitrogen compounds, Oxidationreduction reactions), (*Sulfoxides, Oxidation-reduction reactions), Amines, Oxides, Carboxylic acids, Aldehydes, Ketones, Organic sulfur compounds, Esters, Acetic acids, Acetic anhydrides, Quinones, Hydrazones, Pyridines, O-Heterocyclic compounds

The objective of this research was to determine the scope and nature of the reactions of pyridine N-oxide with electrophiles. A second purpose became the study of the reaction of dimethylsulfoxide with epoxides. A new synthesis of alpha-hydroxyaldehydes and ketones was discovered. It involves the oxidation of epoxides by dimethylsulfoxide, which is used as solvent. The discovery of the oxidation of carboxylic acids by pyridine N-oxides to form aldehydes and ketones led to the enunciation of a new mechanistic concept involving activation of carboxylic acids (by pyridine N-oxide) toward nucleophilic attack at the alpha-position. Side products of this novel 4-electron decarboxylative oxidation, when phenylacetic acid is used, are diphenylmaleic anhydride, mandelic

acid acetate and phenylglyoxylic acid. Evidence was adduced that the currently accepted radical-pair mechanism for the production of esters in the reaction of acetic anhydride with 2- and 4-picoline N-oxide is probably incorrect. Although the attempted oxidation of naphthoquinone with pyridine N-oxide was apparently unsuccessful, interesting results have evolved out of a study of the structure and unusual physical properties of the 'hydrazone' of this dehydrodimer.

**AD-625 590 Fld. 7/3**
*TEXAS TECHNOLOGICAL COLL LUBBOCK DEPT OF CHEMISTRY*
**ION RADICALS. VII. THE REACTIONS OF THIANTHRENE OXIDE IN HYDROCHLORIC ACID,**
by H. J. Shine, and C. F. Dais. 13 Oct 64, 7p.
Contract AF-AFOSR-23-63 Proj. AF-9762
Task 976203
AFOSR 65-2393

Unclassified report

See also AD-625 592.

*Availability: Published in Journal of Organic Chemistry v30 p2145-8 Jul 1965. Copies to DDC users only.*

Descriptors: (*Free radicals, Chemical reactions), (*S-heterocyclic compounds, Free radicals), Oxides, Hydrochloric acid, Halogenated hydrocarbons, Phenols, Chlorination, Ions

The reaction of thianthrene monoxide with concentrated hydrochloric acid gave thianthrene and 2-chlorothianthrene. Thianthrene cation radical was also formed. Chlorine was detected above the surface of the reaction solution. The same reaction in the presence of phenol gave p-chlorophenol, thianthrene, and the monohydrate of p-hydroxyphenylthianthreny
lium chloride; no 2chlorothianthrene was formed. Attempts to chlorinate thianthrene suspended in hydrochloric acid with chlorine and hypochlorous acid failed. The products were thianthrene oxides. The reductive chlorination is therefore, regarded as not arising from reduction to thianthrene followed by electrophilic chlorination. Instead, nucleophilic substitution by chloride ion on the hydroxysulfonium cation is proposed. The formation of chlorine in the reductive chlorination is regarded as coincident with, but not responsible for the formation of 2-chlorothianthrene. A nucleophilic substitution is also applied to interpreting the chlorination of thianthrene in dry chloroform. (Author)

**AD-625 592 Fld. 7/3**
*TEXAS TECHNOLOGICAL COLL LUBBOCK DEPT OF CHEMISTRY*
**ION RADICALS. VI. PHENOXATHIIN AND PHENOXATHIIN 5-OXIDE IN SULFURIC ACID,**
by H. J. Shine, and R. J. Small. 13 Oct 64, 8p.
Contract AF-AFOSR-23-63 Proj. AF-9762
Task 976203
AFOSR 65-2391

Unclassified report

See also AD-625583.

*Availability: Published in Journal of Organic Chemistry v30 p2140-4 Jul 65. Copies to DDC users only.*

Descriptors: (*Free radicals, Spectroscopy), (*O-heterocyclic compounds, Free radicals), (*S-heterocyclic compounds, Free radicals), Oxides, Sulfuric acid, Chemical equilibrium, Spectra (Visible + ultraviolet), Electron spin resonance, Absorption spectrum, Ions, Peroxides, Stability

The reactions of phenoxathiin (phenothioxin) (I) and phenoxathiin 5-oxide (phenothioxin S-oxide) (III) in acidic solutions were studied by ultraviolet, visible, and e.s.r. spectroscopy. It is shown that in 82, 96, and 100% sulfuric acid III is converted to the phenoxathiin cation radical (II). The conversion of III to II was followed by changes in the absorption and e.s.r. spectra. A second cation radical (V) is also formed in the 96% sulfuric acid solutions--that of 3-hydroxyphenoxathiin. It is proposed that in acidic solution III is in equilibrium with protonated III (IV) and the phenoxathiin dication (VI); that the formation of the cation radical II occurs by loss of hydroxyl from IV, and that the hydroxyl is stored either as hydrogen peroxide or a peroxysulfuric acid; and that the reactions which eventually lead to V include, first a hydroxylation of the aromatic ring by attack of water on either of the cations, IV or VI. A hydroxyphenoxathiin 5-oxide (VII) was isolated from solutions of III in 96% sulfuric acid. (Author)

**AD-625 593 Fld. 7/3**
*TEXAS TECHNOLOGICAL COLL LUBBOCK DEPT OF CHEMISTRY*
**ION RADICALS. V. PHENOTHIAZINE, PHENOTHIAZINE 5-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS,**
by H. J. Shine, and E. E. Mach. 13 Oct 64, 13p.
Contract AF-AFOSR-23-63 Proj. AF-9762
Task 976203
AFOSR 65-2392

Unclassified report

*Availability: Published in Journal of Organic Chemistry v30 p2130-9 Jul 1965. Copies to DDC users only.*

Descriptors: (*Phenothiazines, Free radicals), (*Free radicals, Spectroscopy), (*N-heterocyclic compounds, Free radicals), (*S-heterocyclic compounds, Free radicals), Ketones, Chemical reactions, Spectra (Visible + ultraviolet), Electron spin resonance, Ions, Stability, Sulfuric acid, Oxides

The reactions of phenothiazine (I), phenothiazine 5-oxide (II), and phenothiazone-3 (III) in acidic solutions were studied by ultraviolet, visible, and e.s.r. spectroscopy. Solutions of II in 96% sulfuric acid are stable; it is proposed that they contain the protonated phenazothionium ion (VI). Similarly, solutions of III in 96% sulfuric acid are stable, and it is proposed that they contain the protonated hydroxyphenazothionium ion (XIII). Solutions of I in 96% sulfuric acid contain the phenothiazine cation radical (IV) which, in time, is further oxidized to VI. It is shown that III in 59% sulfuric acid is converted to the hydroxyphenothiazine cation radical (XI). It is also shown that in 4 aqueous sulfuric acid II is converted not only to the cation radical IV but also to XI. Mechanisms are proposed for these reactions. It is proposed that in aqueous sulfuric acid II is in equilibrium with protonated II (VIII) and with the phenazothionium ion (V) arising from dehydration of VII. (Author)

**AD-625 612 Fld. 7/3, 7/4, 21/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**GAS IN THE CHEMICAL INDUSTRY,**
by N. P. Munko. 1963, 7p. Rept. no. translation-2039
TT 66-60101

Unclassified report

Trans. of mono. Gazovaya Promyshlennost Uzbekistana, Tashkent, 1963 p127-35.

Descriptors: (*Gases, Chemical industry), (*Chemical industry, USSR), Costs, Fertilizers, Power plants, Plastics, Petroleum, Hydrocarbons, Synthesis (Chemistry), Materials, Manufacturing methods, Fuels

**AD-625 634 Fld. 7/3**
*DUKE UNIV DURHAM N C DEPT OF CHEMISTRY*
**ALKYLATIONS OF PHENYLACETIC, ALPHAALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERS BY MEANS OF SODAMIDE AND SODIUM HYDRIDE,**
by William G. Kenyon, Edwin M. Kaiser, and Charles R. Hauser. 1 Apr 65, 7p. Contract DA-ARO (D)-31-124-G409 ,PHS-CA-04455-06
AROD 3581:10

Unclassified report

*Availability: Published in Journal of Organic Chemistry v30 p2937-42 1965. Copies to DDC users only.*

Descriptors: (*Acetates, Alkylation), (*Alkylation, Acetates), (*Monocyclic compounds, Alkylation), Sodium compounds, Amides, Hydrides, Ammonia, Aromatic compounds, Esters

Various alkylations of ethyl and t-butyl phenylacetates with alkyl halides and further alkylations of the resulting alkyl-alkylphenylacetic esters were effected by means of sodamide in liquid ammonia. The method was successful even with p-chloro- and p-methoxyphenlacetic esters and with p-chlorobenzyl chloride. Typical alkylations were also effected by means of sodium hydride in refluxing monoglyme. Sodamide was preferable for monoalkylations of ethyl or t-butyl phenylacetates, but the two reagents were about equally effective for further alkylations of alkyl-alkylphenylacetic esters. Sodium hydride was better for dialkylation of ethyl phenylacetate with the same halide in a single operation. The present methods were superior to earlier methods. Also the present methods appear useful for the synthesis of certain mono- and dialkylarylacetic acids, which were obtained on hydrolysis of the alkylated esters. Ethyl diphenylacetate was alkylated with certain halides by means of sodamide in liquid ammonia. (Author)

**AD-625 635 Fld. 7/3**
*DUKE UNIV DURHAM N C DEPT OF CHEMISTRY*
**TETRASODIO BIS-BETA-DIKETONES. DICONDENSATIONS WITH ELECTROPHILIC COMPOUNDS,**
by K. Gerald Hampton, and Charles R. Hauser. 8 Apr 65, 5p. Contract DA-ARO (D)-31-124-G409 AROD 3581:9

Unclassified report

*Availability: Published in Journal Organic Chemistry v30 p2934-7 Sep 1965. Copies to DDC users only.*

Descriptors: (*Sodium compounds, Ketones), (*Ketones, Condensation reactions), (*Condensation reactions, Ketones), Amides, Ammonia, Alkylation, N-heterocyclic compounds, Salts

Certain bis-beta-diketones of the type (CH3COCH2CO)2 (CH2)n were converted by means of 4 mol. equiv. of sodamide in liquid ammonia to the corresponding tetrasodio salts, which were dialkylated with benzyl chloride to form the corresponding diterminal derivatives. One of the tetrasodio salts was also condensed at both terminal positions with methyl benzoate and benzophenone to give the corresponding diaroylation- and dialdol-type products, respectively. The diaroylation product was cyclized with ammonia to afford the dipyridone. Certain bis-beta-diketones of the type (C6H5COCH2CO)2 (CH2)n were converted to their tetrasodio salts which were condensed with benzophenone or anisaldehyde to form, after treatment with methanolic acid, the dihydropyrones. (Author)

**AD-625 636 Fld. 7/3**
*EVANS CHEMICAL LAB OHIO STATE UNIV COLUMBUS*
**2,3-NAPHTHOQUINONOID HETEROCYCLES. II. A HIGHLY STABILIZED THIADIAZOLE ANALOG OF ANTHRACENE.**
Revised ed.,
by M. P. Cava, and R. H. Schlessinger. 20 Oct 64, 4p. Contract DA-ARO (D)-31-124-G392
AROD 3631:4

Unclassified report

Revision of manuscript submitted 28 Sep 64.

*Availability: Published in Tetrahedron Letters No. 50 (Gt. Brit.) p3815-8 1964. Copies to DDC users only.*

Descriptors: (*Polycyclic compounds, Synthesis (Chemistry)), (*Thiazoles, Synthesis (Chemistry)), (*Heterocyclic compounds, Synthesis (Chemistry)), Anthracenes, S-heterocyclic compounds, N-heterocyclic compounds, Chemical properties

The synthesis of naphtho /2, 3-c/-1,2,5-thiadiazole, a highly stable anthracene analog which behaves predominantly as a tetravalent sulfur structure, is reported.

**AD-625 637 Fld. 7/3**
*EVANS CHEMICAL LAB OHIO STATE UNIV COLUMBUS*
**THE SYNTHESIS OF A PHENANTHRIDENE FROM AN AROMATIC SCHIFF BASE BY A PHOTOOXIDATIVE RING CLOSURE.**
Revised ed.,
by M. P. Cava, and R. H. Schlessinger. 17 Jun 64, 3p. Contract DA-ARO (D)-31-124-G392 AROD 3631:3

Unclassified report

Revision of manuscript submitted 25 May 64.

*Availability: Published in Tetrahedron Letters no. 31 (Gt. Brit.) p2109-11 1964. Copies to DDC users only.*

Descriptors: (*Polycyclic compounds, Synthesis (Chemistry)), (*N-heterocyclic compounds, Synthesis (Chemistry)), Phenanthrenes, Photochemistry, Oxidation, Ultraviolet radiation

The synthesis of the previously unreported dibenzo/c, i/phenanthridine, by ultraviolet irradiation of a Schiff base (formed from alpha-naphthylamine and alpha-naphthaldehyde), is reported.

**AD-625 638 Fld. 7/3, 8/1**
*EVANS CHEMICAL LAB OHIO STATE UNIV COLUMBUS*
**THE PHOTOLYTIC DECOMPOSITION OF SOME SULFONES BY AN INTERNALLY SENSITIZED PATH,**
by M. P. Cava, R. H. Schlessinger, and J. P. Van Meter. 26 Mar 64, 2p. Contract DA-ARO (D)-31-124-G392 AROD 3631:2

Unclassified report

*Availability: Published in Journal of the American Chemical Society v86 p3173-4 1964. Copies to DDC users only.*

Descriptors: (*Organic sulfur compounds, Photolysis), (*Ketones, Photolysis), Polycyclic compounds, Sulfur compounds, Dioxides

The loss of sulfur dioxide from certain benzylic sulfones upon irradiation is reported.

**AD-625 648 Fld. 7/3**
*MORLEY CHEMICAL LAB WESTERN RESERVE UNIV CLEVELAND OHIO*
**THE DECOMPOSITION OF SILYL HYDROPEROXIDES,**
by Ralph L. Dannley, and George Jalics. 28 May 63, 5p. Contract DA-ARO (D)-31-124-G242 AROD 3342:8

Unclassified report

Taken in part from Doctoral thesis by G. Jalics. Prepared for presentation at National Meeting of American Chemical Society (145th), New York, N. Y. Sep 1963.

*Availability: Published in Journal of Organic Chemistry v30 p3848-51 1965. Copies to DDC users only.*

Descriptors: (*Silanes, Pyrolysis), Aromatic compounds, Peroxides, Organic solvents, Reaction kinetics, Thermochemistry, Heat

The thermal decomposition of triphenylsilyl hydroperoxide in anisole, methyl benzoate, nitrobenzene, and o-dichlorobenzene is first order and has an energy of activation of 22 to 27 kcal./mole. The reaction is complex; for example, in anisole it produces triphenylsilanol, diphenylsilanediol, phenol, and small quantities of p-hydroxyanisole. Triphenylsilyl, methyldiphenylsilyl, and tribenzylsilyl hydroperoxides all thermally decompose in o-dichlorobenzene with similar rates and almost identical energies of activation (26.7 = 0.4 kcal./mole). The effect of the substituent group attached to silicon is therefore small. The decomposition of triphenylsilyl hydroperoxide is unaffected by acid but is accelerated by base. The base-catalyzed reaction is zero order with respect to the peroxide and has an energy of activation of 11.8 kcal./mole. Irradiation with ultraviolet light markedly accelerates the decomposition of triphenylsilyl hydroperoxide and the kinetics remain first order. (Author)

**AD-625 649 Fld. 7/3**
*MORLEY CHEMICAL LAB WESTERN RESERVE UNIV CLEVELAND OHIO*
**THE SYNTHESIS AND PROPERTIES OF TIN HYDROPEROXIDES,**
by Ralph L. Dannley, and Walter A. Aue. 28 May 65, 5p. Contract DA-ARO (D)-31-124-G242 AROD 3342:6

Unclassified report

Prepared for presentation at Meeting of American Chemical Society (150th), Atlantic City, N. J. Sep 1965.

*Availability: Published in Journal of Organic Chemistry v30 n3845-8 1965. Copies to DDC users only.*

Descriptors: (*Metalorganic compounds, Tin compounds), (*Tin compounds, Metalorganic compounds), Peroxides, Synthesis (Chemistry), Chemical properties, Pyrolysis, Reaction kinetics, Heat of activation, Organic solvents

Trimethyltin and triphenyltin hydroperoxides were prepared from the corresponding hydroxides and found to be reasonably stable at room temperature. Trimethyltin hydroperoxide thermally decomposes in a dilute (0.013 M) dioxane solution exhibiting zero-order kinetics through the initial phases of reaction with an energy of activation of 26 kcal./mole. In the latter stages of decomposition in a dilute dioxane solution or at higher concentrations (0.17 M), trimethyltin hydroperoxide exhibits first-order kinetics with an energy of activation (0.17 M solution) of 20 kcal./mole. The products in moles/mole of hydroperoxide are trimethyltin hydroxide (0.475), dimethyltin oxide (0.493), methanol (0.40), and oxygen (0.243). In acetonitrile, trimethyltin hydroperoxide also decomposes with first-order kinetics but the energy of activation is only 11 kcal./mole. The products in moles/mole of hydroperoxide are trimethyltin hydroxide (0.687), dimethyltin oxide (0.313), methanol (0.253), acetamide (0.51), and oxygen (0.302). (Author)

**AD-625 650 Fld. 7/3**
*MORLEY CHEMICAL LAB WESTERN RESERVE UNIV CLEVELAND OHIO*
**THE SYNTHESIS AND REACTIONS OF BISDIPHENYLPHOSPHINIC PEROXIDE,**
by Ralph L. Dannley, and Kishan R. Kabre. 30 Nov 64, 7p. Contract DA-ARO (D)-31-124-G242 AROD 3342:4

Unclassified report

*Availability: Published in Journal of the American Chemical Society v87 n21 p4805-10 1965. No copies furnished.*

Descriptors: (*Organic phosphorus compounds, Chemical properties), Phosphines, Aromatic compounds, Peroxides, Phosphine oxides, Chemical reactions, Synthesis (Chemistry), Catalysis

Bisdiphenylphosphinic peroxide has been found to be stable at - 80 degrees, but at room temperature a rearrangement occurs to an unsymmetrical anhydride. In most solvents the thermal rearrangement is first order with respect to the phosphinic peroxide and has an energy of activation of 22.5 kcal./mole. In the presence of amines the peroxide oxidizes the solvent. This base-catalyzed reaction is first order with respect to both the peroxide and amine concentrations. A basecatalyzed addition to cyclohexene produced trans-alphahydroxycyclohexyl diphenylphosphinate. When the decomposition of the phosphinic peroxide is catalyzed by acids, the first-order dependence on peroxide concentration is maintained. The acid catalysis is complicated however by a concurrent catalysis by the conjugate base. A photochemically induced decomposition of the peroxide is second order with respect to the peroxide and leads to the unsymmetrical anhydride. (Author)

**AD-624 867** See Fld. 11/10

**AD-624 884** See Fld. 20/12

**AD-624 891** See Fld. 11/10

**AD-624 963** See Fld. 7/4

**AD-624 964** See Fld. 7/4

**AD-624 969** See Fld. 7/4

**AD-624 975** See Fld. 7/2

**AD-624 977** See Fld. 11/9

**AD-624 988** See Fld. 7/2

**AD-625 054** See Fld. 11/10

**AD-625 055** See Fld. 11/10

**AD-625 075** See Fld. 20/2

**AD-625 174** See Fld. 11/9

**AD-625 204** See Fld. 11/8

**AD-625 277** See Fld. 9/1

**AD-625 307** See Fld. 7/2

**AD-625 497** See Fld. 7/4

**AD-625 537** See Fld. 8/1

**AD-625 541** See Fld. 11/9

**AD-625 613** See Fld. 11/9

**AD-625 639** See Fld. 7/4

**AD-625 643** See Fld. 7/4

## 7/4. PHYSICAL CHEMISTRY

**AD-624 872 Fld. 7/4, 20/5**
*KANSAS UNIV LAWRENCE DEPT OF PHYSICS AND ASTRONOMY*
**PARAMAGNETIC RESONANCE OF TRIVALENT FES7 IN DOUBLE NITRATE CRYSTALS,**
by J. W. Culvahouse, and L. C. Olsen. 11 Mar 65, 6p.

Unclassified report

Research supported in part by NSF and ONR.

*Availability: Published in Journal of Chemical Physics v43 n4 p1145-9 Aug 15 1965. Copies to DDC users only.*

Descriptors: (*Iron, Paramagnetic resonance), (*Paramagnetic resonance, Iron), (*Masers, Materials), Crystals, Lanthanum compounds, Cerium compounds, Zinc compounds, Nitrates, Impurities, Ions, Cryogen-

ics, Absorption spectrum, Hyperfine structure, Hamiltonian, Nuclear spins, Complex compounds, Low temperature research

The paramagnetic resonance absorption spectra of trivalent iron in double nitrate crystals were identified and fitted by two spin Hamiltonians which correspond to the two sites into which the iron enters these crystals. The two sites appear to be the same as those occupied by trivalent chromium ions. The spin-Hamiltonian constants are reported for lanthanum zinc and cerium zinc double nitrates at temperatures of 4.2, 77, and 193K. The hyperfine interaction constant for Fe57 in either site is (10.9=0.3)X 0.0001/cm which is very close to the value anticipated for a hydrated complex. (Author)

**AD-624 962 Fld. 7/4**
*ATLANTIC REGIONAL LAB HALIFAX (NOVA SCOTIA)*
**AN APPROACH TO THE PROBLEM OF IONIC DISTRIBUTION IN LIQUID SILICATES,**
by C. R. Masson. 16 Dec 64, 21p. NRC 8561
Unclassified report

*Availability: Published in Proceedings of the Royal Society, A, v287 p201-21 1965. Copies to DDC users only.*

Descriptors: (*Silicates, Liquids), (*Ions, Distribution), Chemical equilibrium, Heat of formation, Molecular weight, Phase studies, Iron compounds, Manganese compounds, Lead compounds, Calcium compounds, Oxides

Liquid silicates have been treated as analogous to conventional polymers with a distribution of molecular weights which is governed by considerations of chemical equilibria. Ionic distributions have been calculated as a function of the silica content for several binary systems in regions more basic than the metasilicate, where linear and branched polyionic chains may be considered to predominate. For systems in which the average chain length is sufficiently low or high the distribution may be characterized, to a first approximation, by a single constant the value of which is estimated from activities or independently from the standard free energies of formation of the crystalline silicates. The restriction of ideal mixing is not a condition of the theory, although it is required that the activity coefficients of the silicates vary in a regular manner with increasing size. Limitations and some consequences of the simple theory have been discussed. (Author)

**AD-624 963 Fld. 7/4, 7/3**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**THE KINETICS OF THE INHIBITED AUTOXIDATION OF TETRALIN. II,**
by J. A. Howard, and K. U. Ingold. 10 May 65, 7p. Rept. no. nrc-8571
Unclassified report

*Availability: Published in Canadian Journal of Chemistry v43 p2724-8 1965. Copies to DDC users only.*

Descriptors: (*Polycyclic compounds, Oxidation), (*Oxidation, Reaction kinetics), Inhibition, Phenols, Peroxides, Electric moments, Stereochemistry, Canada

The kinetics of the oxidation of tetralin inhibited by a number of phenols were examined. The chain transfer reaction between phenoxy radicals and hydroperoxides is subject to both polar and steric effects. The rate of this reaction is increased by electron-attracting substituents on the phenol and is decreased both by orthoalkyl groups on the phenol and by an increase in the size of the substituents on the hydroperoxides. (Author)

**AD-624 964 Fld. 7/4, 7/3**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**ABSOLUTE RATE CONSTANTS FOR HYDROCARBON AUTOXIDATION. II. DEUTERO STYRENES AND RINGSUBSTITUTED STYRENES,**
by J. A. Howard, and K. U. Ingold. 6 May 65, 8p. NRC 8591
Unclassified report

*Availability: Published in Canadian Journal of Chemistry v43 p2737-43 1965. Copies to DDC users only.*

Descriptors: (*Hydrocarbons, Oxidation), (*Styrenes, Oxidation), (*Oxidation, Reaction kinetics), Deuterated compounds, Substitution reactions, Free radicals, Electric moments, Peroxides, Canada

The effect of deuterium substitution on the absolute rate constants for the bimolecular chain termination process in the oxidation of styrene indicates that the alpha-hydrogen is abstracted in this reaction. The first order chain termination process is suppressed both by deuteration of styrene at the alpha-position and by the addition of heavy water. A possible mechanism for this termination is proposed. There appear to be small secondary deuterium isotope effects in the propagation reaction. The overall oxidation rates and the propagation rate constants are increased by the addition to the aromatic ring of both electron-attracting and electron-releasing substituents. This is attributed in the former case to the increased stability of the resulting styryl radicals and in the latter case to the increased stability of a dipolar transition state. In hydrogen atom abstraction from 2,6-di-t-butyl-4methylphenol, the peroxy radical from 3-chlorostyrene is more reactive than that from styrene which, in turn, is more reactive than the peroxy radical from 4-methoxystyrene. (Author)

**AD-624 965 Fld. 7/4**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**EXCHANGE REACTIONS IN THE SYSTEM BORON TRIFLUORIDEMETHANOL,**
by J. Paasivirta, and S. Brownstein. 10 Apr 65, 5p. NRC 8598
Unclassified report

*Availability: Published in Journal of the American Chemical Society v87 n16 p3593-6 Aug 20 1965. Copies to DDC users only.*

Descriptors: (*Boron compounds, Fluorides), (*Exchange reactions, Fluorides), (*Nuclear magnetic resonance, Fluorides), Nuclear spectroscopy, Methanols, Protons, Complex compounds, Canada

Rates and the mechanism of exchange of free and complexed boron trifluoride have been determined by fluorine resonance spectroscopy on the system boron trifluoridemethanol. With excess boron trifluoride exchange rates of the hydroxyl proton were also measured. Excess methanol causes rapid proton exchange, but chemical shifts of the individual species were obtained. (Author)

**AD-624 966 Fld. 7/4**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**CHARACTERISTICS OF POROUS CELLULOSE AETATE MEMBRANES FOR THE SEPARATION OF SOME ORGANIC SUBSTANCES IN AQUEOUS SOLUTION,**
by S. Sourirajan. 18 Jan 65, 7p. NRC 8609
Unclassified report

*Availability: Published in I/EC Product Research and Development v4 p201-6 Sep 1965. Copies to DDC users only.*

Descriptors: (*Organic compounds, Separation), (*Organic solvents, Separation), (*Cellulose acetates, Membranes), Solutions, Water, Porous materials, Pressure, Concentration (Chemistry), Canada

The separation and permeability characteristics of the S and S type porous cellulose acetate membranes (Type UA-superdense, supplied by Carl Schleicher and Schuell Co.) have been studied for several organic solutes in aqueous solution. No group of related systems has emerged from the experimental separation data. The effects of the chemical nature of the solute, solute concentration, and operating pressure and temperature on the performance of the membranes are illustrated. (Author)

**AD-624 968 Fld. 7/4**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)*
**ABSORPTION SPECTRUM OF THE CCN RADICAL,**
by A. J. Merer, and D. N. Travis. 29 Jun 65, 40p. Rept. no. nrc-8614
Unclassified report

*Availability: Published in Canadian Journal of Physics v43 p1795-1830 Oct 1965. Copies to DDC users only.*

Descriptors: (*Nitriles, Free radicals), (*Free radicals, Absorption spectrum), (*Absorption spectrum, Nitriles), Electron transitions, Molecular energy levels, Excitation, Vibration, Band spectrum, Selection rules, Canada

A new transient absorption spectrum, attributed to the CCN free radical was discovered in the flash photolysis of diazoacetonitrile, HC(CN)N2; three electronic transitions, between 3 500 A and 4 700 A were photographed for both CC14N and CC15N.

**AD-624 969 Fld. 7/4, 7/3, 11/9**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**THERMAL DEPOLYMERIZATION OF POLYMETHYL METHACRYIATE AND POLY-ALPHAMETHYLSTYRENE IN SOLUTION IN VARIOUS SOLVENTS,**
by S. Bywater, and P. E. Black. 26 Feb 65, 5p NRC 8621
Unclassified report

*Availability: Published in Journal of Physical Chemistry V69 N9 P2967-70 Sep 1965.*

Descriptors: (*Acrylic resins, Decomposition), (*Styrene plastics, Decomposition), Polymers, Solutions, Pyrolysis, Organic solvents, Benzenes, Naphthalenes, Reaction kinetics, Canada

The thermal depolymerization of polymethyl methacrylate and poly-alpha-methylstyrene was investigated using 1,2,4-trichlorobenzene and alpha-methylnaphthalene solvents. The experiments with polymethyl methacrylate show that a mechanism which involves initiation at the chain ends, depropagation, and chain breaking by solvent transfer, holds for all the solvents studied. Chain transfer becomes increasingly effective in the series trichlorobenzene < diphenyl ether < alpha-methylnaphthalene. The rate of chain initiation is almost the same in all solvents. With poly-alpha-methylstyrene, the rate of depolymerization increases linearly with sample molecular weight for molecular weights below 300,000. Above this, the rate is lower than expected, which indicates that some chain termination occurs at higher molecular weights. The experiments suggest that polymer molecules once initiated degrade completely if their molecular weight is not too high. Any variation in rate with solvent should thus be due to variations in ki. In diphenyl ether, decalin, and alpha-methylnaphthalene, the rates are closely similar and are consistent with almost identical chain initiation rates. (Author)

**AD-624 972 Fld. 7/4, 20/13**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING*
**A NEW METHOD FOR FINDING HETEROGENEOUS ENERGY DISTRIBUTIONS FROM PHYSICAL ADSORPTION ISOTHERMS,**
by J. P. Hobson. 11 Jun 65, 9p. NRC 8638
Unclassified report

*Availability: Published in Canadian Journal of Physics v43 p1934-40 Nov 1965. Copies to DDC users only.*

Descriptors: (*Adsorption, Surface properties), (*Vapor pressure, Adsorption), Energy, Distribution, Integral equations, Mathematical models, Vacuum, Canada

A model is described which assumes that a heterogeneous surface has a distribution of adsorption energies f (E) for physical adsorption. A new solution is presented giving f (E) for a number of step-type local isotherms, which are chosen to represent varying degrees of adsorbate-adsorbate interaction. The solution permits f (E) to be obtained quite simply from isotherm data at one temperature. This solution for f (E) may then be used to calculate isotherms at other temperatures. The latter isotherms represent predictions of the model and may be compared with experimental data. (Author)

**AD-624 973 Fld. 7/4, 20/13**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING*
**ANALYSIS OF PHYSICAL ADSORPTION ISOTHERMS ON HETEROGENEOUS SURFACES AT VERY LOW PRESSURES,**
by J. P. Hobson. 11 Jun 65, 11p. NRC 8639
Unclassified report

*Availability: Published in Canadian Journal of Physics v43 p1941-50 Nov 1965. Copies to DDC users only.*

Descriptors: (*Adsorption, Surface properties), (*Vapor pressure, Adsorption), Vacuum, Energy, Distribution, Argon, Nitrogen, Helium, Heatresistant glass, Thermal properties, Canada

A method previously described for finding heterogeneous energy distributions f (E) from physical adsorption isotherms is applied to experimental data for argon, nitrogen, and helium obtained in an ultrahigh vacuum apparatus in the pressure range 5 X 10 to the -10th power < p < 0.001 Torr. The adsorbent was Pyrex and matching temperatures were 77.4, 90.2, and 4.2 K for the three gases respectively. f (E) was found to be asymmetric about a maximum energy whose location depended critically upon the magnitude of assumed adsorbate-adsorbate interaction (Q). However, the isotherms calculated at temperatures other than the matching temperature were insensitive to Q, and hence to the detailed form of the local isotherm. These calculated isotherms showed excellent agreement, not only with the data on Pyrex, but also with the data of several workers using various adsorbents and temperatures. The latter result suggests a similar adsorbing surface for all these adsorbents. (Author)

**AD-624 974 Fld. 7/4, 20/13, 8/12**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**ENTROPY CHANGES AT THE PHASE TRANSITIONS IN ICE,**
by E. Whalley, and D. W. Davidson. 22 Mar 65, 3p. Rept. no. nrc-8641
Unclassified report

*Availability: Published in The Journal of Chemical Physics V43 N6 P2148-9 Sep 15 1965. Copies to DDC users only.*

Descriptors: (*Ice, Phase studies), (*Entropy, Ice), Transformations, Spectroscopy, Crystal structure, Canada

**AD-624 985 Fld. 7/4**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE PHYSICAL LAB*
**THE EFFECT OF PRESSURE ON THE DISSOCIATION OF MANGANESE SULFATE ION PAIRS IN WATER,**
by F. H. Fisher, and D. F. Davis. 1 Feb 65, 5p. Rept. no. mpl-U-62/64
Contract Nonr-2216 (05)
Unclassified report

*Availability: Published in Journal of Physical Chemistry v69 N8 p2595-8 Aug 1965. Copies to DDC users only.*

Descriptors: (*Manganese compounds, Sulfates), (*Sulfates, Dissociation), (*Dissociation, Pressure), Ions, Water, Chlorides, Electrical conductance, Volume, Magnesium compounds, Adsorption (Physical), Acoustics, Acoustic properties

Conductivity at 25 of aqueous solutions of MnSO4 and MnCl2 has been measured as a function of pressure up to 2000 atm. for concentations from 0.0005 to 0.02 M. The effect of pressure on the molal dissociation constant of MnSO4 was calculated with the conductance equation used by Davies, Otter, and Prue. Based on a two-state dissociation model, the difference of partial molal volumes between products and reactants, was found to be in agreement with the value calculated on the basis of theory by Fuoss, namely -7.4 cc./mole. Although MnSO4 and MgSO4 solutions show reasonable agreement in the difference of partial mold volumes at atmospheric pressure at the lower concentrations, small differences in the pressure dependence of the equilibrium constant are observed which may be related to the marked differences in acoustic absorption exhibited by these salts. (Author)

**AD-624 996 Fld. 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**RESEARCH ON F-VALUES: COMPREHENSIVE REPORT.**
Work assignment no. 79,
by Edward Gelins. 7 Dec 65, 47p. Rept. no. atd-65-86
TT 65-64829
Unclassified report

Consists of a Soviet review from the end of 1963 to the middle of 1965. Rept. on Surveys of Soviet Scientific and Technical Literature. See also AD-622 239.

Descriptors: (*Electron transitions, Atomic spectroscopy), (*Atomic spectroscopy, Electron transitions), Harmonic generators, Line spectrum, Atomic energy levels, Light, Scattering, Computers, Absorption, State-of-the-art reviews, USSR

Research on oscillator strengths of electron transitions from one energy level to another as shown in the spectral lines of chemical elements published in the Soviet literature is abstracted and evaluated. The approach to solving the problem of the oscillator strength of spectral lines has changed in the Soviet literature. The method of hooks introduced in Soviet investigations by Rozhdestvenskiy and used as the main method of investigation is now reduced to the status of an auxiliary method and an intensive search for new methods is under way. Al'perovich discussed the dispersion of light in the absorption bands of complex molecules in solutions and its application to determining oscillator strengths. Anderson and Zilitis developed a semi-empirical program for computing the wave function on electronic computers. A set of tables is given in which the oscillator strengths are given for various transitions and chemical elements. The method of computing probabilities of nonadiabatic transitions between two electronic states is discussed by Nikitin in a theoretical approach to the problem by integrating two coupled wave equations along the complex plans of a coordinate. The cases of zero differences of energies are discussed.

**AD-625 008 Fld. 7/4, 19/1, 7/2, 21/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL AMMUNITION DEPOT CRANE IND*
**THE PRODUCTION OF VISIBLE LIGHT BY THE THORIA-CERIA MANTLE; PHYSICAL CHARACTERISTICS AND A PROPOSED THEORY OF THE OCCURING MECHANISMS AND PROCESSES,**
by Duane M. Johnson. 15 Jul 65, 24p. Rept. no. rdtr-66
Unclassified report

Descriptors: (*Flares, Chemical properties), (*Thorium compounds, Dioxides), (*Cerium compounds, Dioxides), (*Light, Production), Catalysis, Chemical reactions, Thermochemistry, Combustion

An explanation of the production of visible light by a thoria-ceria mantle is presented. It is proposed that the thoria acts as a chemical catalyst and localizes the exothermic reaction within the mantle structure. (Author)

**AD-625 024 Fld. 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*MINNESOTA UNIV DULUTH*
**OCTOBER 1965 STATUS REPORT,**
by Howard G. Hanson. Oct 65, 5p. Contract Nonr-710 (59) Proj. NR-017-712
Unclassified report

Descriptors: (*Sodium compounds, Iodides), (*Atomic spectroscopy, Sodium compounds), (*Fluorescence, Sodium compounds), Dissociation, Ultraviolet spectroscopy, Doppler effect

Measurements of the line shapes of the D lines of the atomic fluorescence of the sodium iodide dissociated by the ultraviolet light were made. The reduction of intensity of light that was passed through an extremely narrow band pass instrument made it necessary to cool the phototube to reduce the dark current noise in the cases where the exciting ultraviolet light was also highly attenuated by the polarizing disc. The Doppler widths were somewhat narrower than expected. Some remaining uncertainties in the effective resolving power at the time of each measurements must be eliminated (by calibration against the standard Hg 198 lamp immediately before and after each measurement) before a precise quantitative determination of the Doppler widths for the D lines can be achieved. Both lines appear to be equally broadened. (Author)

**AD-625 110 Fld. 7/4**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS*
**ELECTRON-ION RECOMBINATION IN NITRIC OXIDE IN THE TEMPERATURE RANGE 196 TO 358K,**
by R. C. Gunton, and T. M. Shaw. 24 May 65, 8p.
Unclassified report

*Availability: Published in The Physical Review v140 n3A pA756-63 Nov 1 1965. Copies to DDC users only.*

Descriptors: (*Recombination reactions, Nitrogen compounds), (*Nitrogen compounds, Oxides), Ions, Electrons, Mass spectroscopy, Electron density, Frequency shift

The recombination of NO (+) ions with electrons was studied in photoionized nitric-oxide-neon gas

mixtures. A pulsed hydrogen lamp with a lithium fluoride window produced the ionizing ultraviolet radiation, which was incapable of exciting or ionizing Ne. Following an ionizing pulse, the decay of electron density was measured by a microwave-cavity reflection technique. Low NO pressures, 0.5 to 80 mTorr, were used to reduce negativeion formation, and high Ne pressures, up to 132 Torr, were used to reduce ambipolar diffusion. Highly purified gases and ultrahigh-vacuum techniques were employed. Massspectrometer identification of the positive ion in NO-Ne mixtures indicated the presence of only NO (+) ions. Negative ions, predominantly NO2 (-), were observed to increase in number rapidly as NO pressure increased above 3 mTorr, and the uncorrected electron-recombination coefficient, computed from plots of reciprocal frequency shift versis time, increased as NO pressure increased, very likely owing to the influence of negative ions. Correction for negative-ion and diffusion effects was made by use of a computer-aided analysis. The NO (+) electron recombination coefficient, measured at NO pressures of 0.5 and 1.0 mTorr under conditions of small negative-ion influence and at gas temperatures of 196, 298, and 358K is given. The results of this study together with other laboratory measurements suggest an approximate T to the -1.2 power dependence of the recombination coefficient. (Author)

**AD-625 175 Fld. 7/4, 21/9.1, 7/2**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF FUEL TECHNOLOGY*
**DETERMINATION OF THE DECOMPOSITION KINETICS OF HYDRAZINE USING A SINGLE-PULSE SHOCK TUBE,**
by E. T. McHale, B. E. Knox, and H. B. Palmer. 1965, 10p. Contract Nonr-1858 (25) Proj. NR-098-038 AROD 4047:1
Unclassified report

*Availability: Published in Symposium (International) on Combustion (10th) p341-51 1965. Copies to DDC users only.*

Descriptors: (*Hydrazine, Decomposition), Reaction kinetics, Shock tubes, Shock waves, Heat of activation, Liquid rocket propellants

The rate of decomposition of carefully purified hydrazine was measured by a single-pulse shock-tube method over the temperature range 970 to 1120K, and the pressure range 2.3 to 8.6 atm, at a concentration of about 1 mole per cent in argon. The experimental data on reaction order, activation energy, and stoichiometry, together with kinetic and thermochemical considerations, lead to the conclusion that the decomposition kinetics obey a simple nonchain mechanism. Possible chain mechanisms are examined in detail and found to be at variance with the observations. By making use of some recent data of Michel and Wagner, a high-pressure limiting rate constant is obtained for the reaction N2H4 to 2 NH2, over the temperature range 970 to 1550K. Thus D (H2N-NH2) is determined to be 54 kcal, with an uncertainty of about 2 kcal. At low pressures, approximately six effectively classical oscillators appear to contribute energy to the unimolecular decomposition of N2H4. An apparent activation energy of ca 36 kcal is predicted for the second-order flame reaction, in agreement with experiments. (Author)

**AD-625 179 Fld. 7/4, 8/10**
**CFSTI Prices: HC $6.00 MF $1.50**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY*
**ION FRACTIONATION IN DROPS FROM BREAKING BUBBLES.**
Doctoral thesis,
by Ferren MacIntyre. Sep 65, 275p. Rept. no. dsr-8841
Proj. NR-083-157
Unclassified report

Descriptors: (*Atmospheric precipitation, Ions), (*Drops, Atmospheric precipitation), (*Bubbles, Drops), Aerosols, Sodium compounds, Phosphates, Sea water, Raindrops, Marine meteorology, Films, Microtomes, Adsorption

Available data for ion ratios in precipitation are analyzed and shown to be consistent with the hypothesis of a distinctive marine aerosol in which all reported ions are enriched with respect to Na, compared with sea water values. Experiments with bubble-produced aerosols from a Na (22)P (32)04 solution show that the fractionation ratio (P04 (3-)/Na (+))aerosol/ (P04 (3-)/Na (+))solution is greater than 1 for all drop sizes from 0.5 to 50 microns, and may be as high as 700 for 15micron drops. Drops formed by the central jets of small bubbles show enrichment ratios E (=F-1) below 10 which are independent of drop size, while drops from the film caps of large bubbles frequently show an additional high peak, log-normal and centered on micron drops, with a standard deviation (about the geometric mean) of log 1.75. It is suggested that small bubbles form an efficient surface microtome which selectively ejects only the uppermost 1-micron layer of the solution into the aerosol phase, and that this selectivity is responsible for the anomalous ion ratios reported in marine precipitation. (Author)

**AD-625 211 Fld. 7/4, 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*CHICAGO UNIV ILL DEPT OF CHEMISTRY*
**MAGNETIC ORDERING IN VF2.**
Technical rept.,
by J. W. Stout, and W. O. J. Boo. 1965, 12p.
Rept. no. tr-18
Contract Nonr-2121 (13)
Unclassified report

Prepared for publication in Journal of Applied Physics.

Descriptors: (*Magnetic properties, Vanadium compounds), (*Vanadium compounds, Fluorides), Crystal structure, Metallic crystals, Thermal properties

The compound VF2 was prepared by treatment of vanadium metal with HF gas at 1250C to form VF3, and subsequent reduction to VF2 at 1150C with a controlled mixture of HF and H2. Debye-Scherrer photographs show VF2 to have the rutile structure, isomorphic with MnF2, FeF2, CoF2, NiF2 and ZnF2. Heat capacity measurements from room temperature to 5K, using a platinum resistance thermometer, show a peak in heat capacity at 7.0K, presumably associated with long-range magnetic ordering, and a large magnetic contribution to the heat capacity at higher temperatures. The major fraction of the magnetic entropy of R ln 4 is acquired in the short range order region. The behavior of the magnetic entropy is similar to that found in CuC12 and CrC12 where there is extensive short-range magnetic ordering in one-dimensional chains of metal atoms coupled by relatively strong exchange forces.

**AD-625 212 Fld. 7/4, 20/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**LOWER BOUNDS FOR THE EIGENVALUES OF FIRST ORDER DENSITY MATRICES,**
by Werner Kutzelinigg, and Vedene H. Smith. 15 Sep 64, 17p. Rept. no. scientific-27
Contract AF-61 (052)-701 ARL 65-249
Unclassified report

Descriptors: (*Atomic orbitals, Density), (*Atomic energy levels, Wave functions), Quantum mechanics, Electrons, Energy, Integrals, Determinants, Hamiltonian, Perturbation theory, Sweden

Lower bounds for the first n eigenvalues of the first order density matrix corresponding to a quantum mechanical state of an n-electron system are derived under the three assumptions: (1) that one knows a lower bound to the overlap integral of an arbitrary normalized Slater determinant with the true wave function. (2) that the configuration interaction expansion of the true wave function contains only singly, doubly etc. up to m-fold excited configurations with respect to a 'ground' configuration, where m < or n =. (3) that the electronic interaction term in the Hamiltonian is proportional to a parameter, lambda, and that a perturbation expansion in terms of this parameter is possible. In the latter case one finds that the idempotency of the one particle density matrix is stable with respect to first order perturbations. (Author)

**AD-625 213 Fld. 7/4, 20/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**THE INDEPENDENT PARTICLE MODEL FOR MANYELECTRON SYSTEM. II. SYMMETRY PROPERTIES AND CRITERIA FOR THE VALIDITY OF THE INDEPENDENT PARTICLE MODEL.**
Scientific rept.,
by Werner Kutzelnigg, and Vedene H. Smith,Jr..
1 Nov 64, 38p. Rept. no. scientific-33
Contract AF61 (052)-701 ARL 65-250
Unclassified report

See also N65-25356.

Descriptors: (*Atomic orbitals, Mathematical models), (*Molecular orbitals, Mathematical models), Electrons, Quantum mechanics, Density, Atomic energy levels, Wave functions, Sweden

Contents: Symmetry and orthogonality properties of the orbitals (Symmetry of the 'best density' approximation, Definition and properties of 'open' and 'closed shell' states, The principle of doubly filled orbitals and its limitations, Symmetry of the 'best energy' approximation, Symmetry of the 'best overlap' approximation); Conditions for the validity of the independent particle model (Comparison with the true first order density matrix, Overlap with the true wave funtion, The independent particle model for closed and open shell states); On localized orbitals (Localizability and independence of quantum mechanical systems, Definition of 'localized orbitals').

**AD-625 214 Fld. 7/4, 20/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**THE INTERACTION POTENTIAL SURFACE FOR H3.**
Scientific rept.,
by Frank E. Harris, David A. Micha, and Herbert A. Pohl. 15 Jan 65, 17p. Rept. no. scientific-36
Contract AF61 (052)-701 ARL 65-251
Unclassified report

Descriptors: (*Hydrogen, Molecular orbitals), (*Molecular orbitals, Potential theory), Wave functions, Integrals, Numerical analysis, Chemical bonds, Molecular association, Nuclear structure, Sweden

Calculations were made on the properties of the triatomic hydrogen, H3, system interaction using a split-shell molecular orbital wave function based on one orbital per atomic center. Several integral approximations were used to simplify computation. The results obtained refer to both the intermediate state parameters and to the interaction potential surface, especially including the transition region between short range (chemical binding) potential and long range potential. (Author)

**AD-625 302 Fld. 7/4, 20/12**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ON THE WIDTH OF COMBINED RESONANCE BANDS,**
by I. I. Boiko. 8 Dec 65, 11p. Rept. no. ftd-TT-65-925
TT 66-60079
Unclassified report

Unedited rough draft trans. of Ukrayinskyi Fizychnyi Zhurnal (USSR) v9 n12 p1286-90 1964.

Descriptors: (*Electron spin resonance, Bandwidth), (*Cyclotron resonance phenomena, Bandwidth), Paramagnetic resonance, Electric currents, Bandwidth, Electron transitions, Relaxation time, Spin, Atomic energy levels, Carriers (Semiconductors), USSR

Factors due to band width of combined resonance on current carrier zones are discussed.

**AD-625 336 Fld. 7/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**HEATS OF FORMATION OF METALLIC BORIDES BY FLUORINE BOMB CALORIMETRY.**
Final rept., 1 Oct 63-30 Jun 65,
by Eugene S. Domalski, and George T. Armstrong. Oct 65, 58p. Rept. no. nbs-8962
Contract AF33 (615)-1003 Proj. AF-3048 ,NBS-221-0428 Task 304802
AFAPL TR-65-110
Unclassified report

See also AD-600 396.

Descriptors: (*Borides, Metallic compounds), (*Metallic compounds, Borides), (*Heats of formation, Borides), Boron, Boron compounds, Fluorides, Aluminum compounds, Borides, Carbon compounds, Carbides, Graphite, Calorimeters, Heat of combustion, Combustion, Fluorine, Combustion products

The purpose was to provide heat of formation data on boron and intermetallic borides applicable to calculations involving the combustion of slurry fuels. The heats of formation of BF3 (g), CF4 (g), B4C (c), AlB2.215 (c), alphaAlB12 (c) and gamma-AlB12 (c) were calculated from the heats of combustion of boron, graphite, B4C (c), AlB2.215 (c), alpha-AlB12 (c) and gamma-AlB12 (c) in fluorine at high pressures. The heat measurements were made in a bomb calorimeter. The samples were subjected to thorough analysis and careful characterization. Three different methods were used to prepare pelleted mixtures of the samples with Teflon powder for combustion. The completeness of combustion was determined by analysis of the unburned sample remaining in the bomb after an experiment. The heats of combustion in fluorine at 298K and the corresponding standard deviations of the means are given, along with the substances for which they were determined. The standard heats of formation at 298K and the estimated over-all accuracies are also given.

**AD-625 343 Fld. 7/4, 20/12**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA UNIV SAN DIEGO DEPT OF PHYSICS*
**ONE-PARTICLE PROPERTIES OF AN INHOMOGENEOUS INTERACTING ELECTRON GAS.**
Technical rept.,
by L. J. Sham, and W. Kohn. 14 Dec 65, 27p.
Rept. no. tr-36
Contract Nonr-2216 (11) Proj. NR-017-630
Unclassified report

Descriptors: (*Atomic energy levels, Metals), (*Electrons, Excitation), Ground state, Green's function, Operators (Mathematics), Field theory, Approximation (Mathematics), Potential theory

In previous publications (especially P. Hohenberg and W. Kohn, Phys. Rev. 136, B864 (1965) and W. Kohn and L. J. Sham, Phys. Rev. 140, A1133 (1965)) a theory of the ground state of an inhomogeneous interacting electron gas was developed, in which the electronic density n (r) played a dominant role. This approach is extended to the one-particle Green's function and physical properties related to it, such as single-particle-like excitations and, in the case of metals, the Fermi surface. The Dyson mass operator $\xi$ is studied as a function of its spatial arguments and as a functional of n (r), and, in both both senses, it is found to have important short-range properties. An approximation for $\xi$, which is exact for systems of slowly varying density, is proposed. This leads to simple, explicit, Schroedinger-like equations for the single-particle-like excitations, whose solution determines their energies and lifetimes. It is shown how to apply this procedure to metals. (Author)

**AD-625 377 Fld. 7/4, 20/10**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**THEORY OF INTERNAL RELAXATION IN CHEMICAL KINETICS,**
by G. Ludwig Hofacker. 15 Jan 65, 47p. Rept. no. scientific-37
Contract AF61 (052)-701 ARL 65-252
Unclassified report

*Availability: Reference only at DDC HQ after original copies exhausted. Not for sale.*

Descriptors: (*Chemical reactions, Reaction kinetics), Quantum mechanics, Chemical reactions), Statistical mechanics, Rearrangement reaction, Atomic energy levels, Relaxation time, Perturbation theory, Chemical structure

Internal relaxation processes for molecular systems are described by means of a non-homogeneous master equation for non-diagonal elements of the density matrix. (Author)

**AD-625 411 Fld. 7/4, 20/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**DIFFERENT BANDS FOR DIFFERENT SPINS. I. THE COHESIVE ENERGY OF AN ALKALI METAL. II. APPLICATION TO A LINEAR CHAIN OF HYDROGEN ATOMS. CRYSTAL INTEGRALS AND MOLECULAR INTEGRALS,**
by Jean-Louis Calais. 15 Sep 64, 36p. Rept. no. scientific-28 Scientific-29
Contract AF61 (052)-701 Grant ,NSF-NsG-512
ARL 65-256
Unclassified report

Descriptors: (*Molecular orbitals, Alkali metals), (*Crystal structure, Integrals), Hydrogen, Spin, Atomic orbitals, Crystal lattices, Symmetry (Crystallography), Ground state, Quantum mechanics

The alternant molecular orbital (AMO) method was adapted to calculate the cohesive energy of an alkali metal. A certain amount of correlation between electrons with different spins is thereby taken into account. This is particularly important for large internuclear distances. While the ordinary Hartree-Fock energy for large distances tends to a value which is considerably higher than the ground state energy of free atoms, the AMO-energy tends to the correct limit. The main emphasis is placed on an AMO-version of the MO-LCAO-method, with the overlap between the atomic orbitals properly treated. Despite obvious similarities there are important differences in the type and amount of integral calculations required in a MO-LCAO calculation for a crystal and molecule. These differences are discussed and it is pointed out that some of the difficulties connected with 'crystal integrals' can be overcome by means of Lowdin's 'combined atomic orbitals.' A general formula is derived for the expansion of a function centered at one lattice site, around another site, when all the coordinate axes at the two sites are parallel. By means of this formula one can take maximum advantage of the crystal symmetry in the integral calculations. As illustrative examples we treat some typical Coulomb and exchange integrals occurring in calculations for crystals with cubic symmetry. (Author)

**AD-625 430 Fld. 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)*
**ON THE PROBLEM OF SEPARATING HYDROAZEOTROPES,**
by L. L. Dobroserdov. Sep 65, 32p. Rept. no. t-423-R
TT 66-60089
Unclassified report

Trans. of Tekhnologicheskii Institut Pishchevoi Promyshnnosti. Trudy (USSR) v15 p55-77 1958.

Descriptors: (*Ethanols, Phase studies), (*Water, Phase studies), (*Calcium compounds, Phase studies), Chlorides, Theory, Separation, Liquids, Vapors, Solvents, Solvates, Vapor pressure, Canada, USSR

Principal theoretical concepts of the action of salts: The possible cause of the more intensive enrichment of the vapor phase by one of the components under the influence of salts is explained. It seems that, in the first approximation, the action of salts in a complex solvent may be set forth as follows. In the dissolving of a salt there takes place a disruption of the crystal lattice and the salt ions formed are distributed throughout the mass of the liquid phase (the solvent). The interaction between the solvent and the dissolved salt may shift away from simple solvation, that is, from a dipole interaction, until complexes of different stability are formed, including hydrogen and other bonds. The change in the activities of the liquid components in the presence of salts, evidently takes place through the unequal attractions exerted by the salt ions on two solvent molecules of different character. There takes place an accumulation of alcohol molecules outside the influence of the salt ion, increasing the tendency of the less polar solvent to volatilize from the solution and pass into the vapor phase. The alcohol vapor pressure over the solution is increased as compared with the system without salt. The activity of the alcohol in the solution is increased. The vapor phase becomes poorer in the second component; its vapor pressure is reduced. To sum up: under the influence of a salt there takes place a change, favoring separation, in the ratio of partial pressures of the components.

**AD-625 431 Fld. 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)*
**LIQUID-VAPOR PHASE EQUILIBRIUM OF ALCOHOL WATER MIXTURES IN THE PRESENCE OF CERTAIN SALTS, AT ATMOSPHERIC PRESSURE,**
by L. L. Dobroserdov, and V. P. Ilyina. Nov 65, 29p. Rept. no. t-422-R
TT 66-60090
Unclassified report

Trans. of Tekhnologicheskii Institut Pishchevoi Promyshlennosti. Trudy (USSR) v13 p92-100 1956; v14 p139-42, 143-6, 147-50, 151-4 1958.

Descriptors: (*Ethanols, Phase studies), (*Water, Phase studies), Liquids, Vapors, Barometric pressure, Calcium compounds, Sodium compounds, Chlorides, Acetates, Potassium compounds, Zinc compounds, Canada, USSR

The papers concern phase studies with calcium chloride, potassium acetate, sodium chloride, sodium acetate, and zinc chloride.

**AD-625 451 Fld. 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*HUGHES RESEARCH LABS MALIBU CALIF*
**THE CESIUM IONIZATION CROSS SECTION FROM THRESHOLD TO 50 EV.,**
by H. Heil, and B. Scott. Nov 65, 27p. Rept. no. scientific-1
Contract AF19 (628)-4297 Proj. AF-8659 Task 865902
AFCRL 65-815
Unclassified report

Descriptors: (*Cesium, Ionization), (*Ionization, Probability), Excitation, Discharge tubes, Voltage, Atomic energy levels

The ionization cross section sigma which was recently measured by Brink at 50 eV and above has been measured down to threshold in a Tate and Smith type apparatus designed for absolute measurements. The density in the collision space was determined by a surface ionization detector which permitted an over-all accuracy on the cross section of 10 percent. It was found: (1) sigma = 5.3 A squared at 50 eV. This is smaller by a factor of 1.8 than the above experiment and the theoretical values of the Gryzinski method - the discrepancy has not been explained. (2) The cross section near threshold is linear over a range of 0.8 eV with a slope of 2.2 A squared eV. Above 0.8 eV, it rises less than linearly. The initial slope is smaller by a factor of 3 than the earlier measurements of Nottingham. (3) Above 12 eV, excitation to the autoionizing states is seen, and above 18 eV, an additional contribution to the total cross section begins. The latter is due to ionization to an excited state of the ion. Cross sections for these two processes have been related to spectroscopic measurements of Beutler, et al., and have been separated from the basic ionizing channel. The curve for autoionization is resonant in nature with a maximum of 0.8 A squared. The ionization to the excited ion has an estimated maximum cross section of 1.5 A squared at 60 eV. (Author)

**AD-625 470 Fld. 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA UNIV RIVERSIDE*
**THE ELECTRICAL PROPERTIES OF SEMIPERMEABLE MEMBRANES.**
Annual summary rept. 1 Jan-31 Dec 65,
by L. J. Bruner. May 65, 46p. Contract Nonr-4443 (00) Proj. NR-314-102
Unclassified report

Descriptors: (*Membranes, Semipermeability), (*Electrical properties, Membranes), Kinetic theory, Electrolytes, Ions, Voltage, Potential theory, Electrical conductance, Equilibrium, Numerical analysis

A general formulation of the problem of stationary ion flow through semipermeable membranes was presented in the first paper of this series. The formalism is applied here to the evaluation of membrane conductance for the special case of unipolar ion flow between symmetric electrolytes. Thus it is assumed that the permeable ions carry one sign of charge only. Furthermore, the valences of all ions in solution on both sides of the membrane are taken to be of equal absolute magnitude. Conductance results obtained by numerical methods are presented for several representative sets of the parameters which characterize the membrane system in equilibrium. These results are discussed qualitatively with emphasis upon the contribution of particular system parameters to the non-linearities observed. Approximate analytic conductance relations, valid for high current levels, are also given. (Author)

**AD-625 497 Fld. 7/4, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*BIRMINGHAM UNIV (ENGLAND) DEPT OF CHEMISTRY*
**MICROWAVE SPECTROSCOPIC STUDIES OF MOLECULES.**
Scientific rept.,
by J. Sheridan. 31 Jan 65, 14p. Rept. no. Scientific-3
Contract AF-EOAR-62-1 AFOSR 65-1687
Unclassified report

Descriptors: (*Halogenated hydrocarbons, Microwave spectroscopy), (*Alkynes, Microwave spectroscopy), Molecular structure, Dipole moments, Excitation, Deuterated compounds, Isomers (Chemistry), Great Britain

Detailed spectroscopic studies are summarized for acetyl acetylene and trifluoroethylene. For the first of these, assignments and barrier-heights were found for three isotopic forms and very consistent results derived. For trifluoroethylene, an exhaustive study of vibrationally excited molecules was made, leading to identification of spectra for carbon-13 species in natural concentration. When these were combined with data for the deuterated species, all possible microwave structural information for the molecule was derived. Dipole moment studies of these substances are also reported with preliminary work on other molecules. Computational procedures in spectral analysis were developed. (Author)

**AD-625 524 Fld. 7/4, 11/9, 6/15**
*ALBERTA UNIV EDMONTON*
**SEMIQUANTITATIVE ASPECT OF SHORT BRANCH DETECTION BY USING POLYELECTROLYTE EXPANSIVE EFFECTS,**
by W. M. Pasika, and L. H. Cragg. 23 Dec 64, 7p.
Unclassified report

*Availability: Published in Journal of Polymer Science pt a v3 p2527-33 1965. Copies to DDC users only.*

Descriptors: (*Dextran, Molecular structure), (*Polymers, Molecular structure), (*Electrolytes, Polymers), Quantative analysis, Viscosity, Solvents, Concentration (Chemistry), Canada

Linear and branched dextran polyelectrolyte reduced viscosity-concentration curves, obtained by employing a solvent which contained a low concentration of simple electrolyte, were characterized by means of a set of relative expansion ratios, Rncm. The sets of Rncm for branched and linear dextran polyelectrolyte samples of identical degree of substitution, whose reduced viscosity-concentration curves were determined in the same solvent, did not differ. This is interpreted as indicating that the same expansive mechanism operated in the linear and branched polyelectrolyte systems when they were diluted. Plots of Rncm versus absolute concentration for linear and branched polyelectrolyte samples (of identical degrees of substitution, of different degrees of substitution and whose reduced viscosities were determined in solvents of different simple electrolyte concentrations) gave straight lines with a common intercept on the ordinate axis but with different slopes. It is suggested that the slope factor or p values of these lines might be employed as a means of detecting and measuring short branching in polymers convertible to polyelectrolytes. (Author)

**AD-625 536 Fld. 7/4, 14/2**
*RENSSELAER POLYTECHNIC INST TROY N Y DEPT OF CHEMISTRY*
**VISCOSITY MEASUREMENTS OF IONIC MELTS AT TEMPERATURES TO 1100C.**
Revised ed.,
by Roger D. Reeves, and George J. Janz. 12 Apr 65, 6p. Contract AF-AFOSR-181-63 AFOSR 65-2200
Unclassified report

Research supported in part by Office of Naval Research, Washington, D. C. Chemistry Div. Revision of manuscript submitted 5 Jan 65.

*Availability: Published in Review of Scientific Instruments v36 n8 p1124-9 Aug 1965. Copies to DDC users only.*

Descriptors: (*Salts, Melting), (*Viscosity, Salts), (*Test methods, Viscosity), High-temperature research, Theory, Crucibles, Laboratory equipment

An extension of the theory of the oscillating crucible gives and equation in eta to 1/2 power which is particularly useful as an absolute method for viscosity calculation. While more complex in theory, the oscillating crucible possesses useful advantages for high temperatures, namely, the features of a small flat temperature zone, and of a completely sealed sample container. Use of a closely fitting liner in the crucible offers a further advantage in that an exchange of the melt container is possible without any changes in the experimental assembly. Results are reported for a number of 'reference' liquids at 25C and at 440C (KNO3), and for CaCl2 (785-970C) and BaCl2 (985-1040C). An error analysis shows that the precision is extremely sensitive to the decrement, delta sub m this appears as the largest error source. An error of viscosity of = 4% is calculated.(Author)

**AD-625 540 Fld. 7/4**
**CFSTI Prices: HC $4.00 MF $1.00**
*WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY*
**DETERMINATION OF PARTICLE SIZE DISTRIBUTIONS IN EMULSIONS BY LIGHT SCATTERING.**
Technical rept. (doctoral thesis),
by Bettye W. Greene. 15 Nov 65, 138p. Rept. no. tr-14 (60)
Contract Nonr-3511 (00) Proj. NR-051-380
Unclassified report

Descriptors: (*Particle size, Colloids), (*Colloids, Particle size), Light, Scattering, Distribution functions, Polycyclic compounds

The light scattering method for determining size distributions in liquid dispersoids was found applicable to the spontaneous dimethylnaphthalene emulsions which contained sub-micronic particulates and were approximately 30% more heterodisperse than the synthetic heterodispersions of 'monodisperse' latices used to verify the method experimentally. A bi-parametric, exponential, positively-skewed distribution function closely approximating the distribution law commonly obeyed by emulsions was assumed. The effect of stabilizer concentration, and the effect of aging on the size distribution of emulsions, was systematically investigated. Two scattering spectra, the turbidity and the scattering ratio as a function of wavelength, were obtained. Although the turbidity or transmission measurements are, in general, simpler and more accurate than those of scattering ratio, the turbidity spectra was found too insensitive to give an independent, unambiguous estimate of sizes in these moderately heterodisperse systems. Electronic comparison and fitting of the experimental with the theoretical scattering spectra corresponding to various distribution parameters were accomplished with the IBM 7070 computer. (Author)

**AD-625 589 Fld. 7/4, 14/2**
*TEXAS TECHNOLOGICAL COLL LUBBOCK DEPT OF CHEMISTRY*
**THERMODILATOMETRIC ANALYSIS: SOME CHEMICAL APPLICATIONS,**
by Wesley W. Wendlandt. 8 Oct 64, 5p. Contract AF-AFOSR-23-63 AFOSR 65-2394
Unclassified report

*Availability: Published in Analytica Chimica Acta v33 p98-101 1965. Copies to DDC users only.*

Descriptors: (*Dilatometers, Operation), (*Chemical reactions, Measurement), (*Phase studies, Laboratory equipment), Thermochemistry, Decomposition, Transformations, Test equipment, Chemical analysis

Some applications of thermodilatometric analysis are discussed. The technique may be used for the determination of solid-solid phase transitions and decomposition reactions. An inexpensive recording dilatometer is described. (Author)

**AD-625 595 Fld. 7/4, 20/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*KIEL UNIV (WEST GERMANY) INSTITUT FUER EXPERIMENTELLE PHYSIK*
**NEW METHOD OF MEASURING TRANSITION PROBABILITIES.**

Final technical rept.,
by F. Karstensen, and J. Richter. 31 Aug 65, 31p.
Contract AF-EOAR-63-110 AFML TR-65-417
Unclassified report

Descriptors: (*Electron transitions, Probability), Line spectrum, Atomic energy levels, Sodium, Iron, Argon, Spectrum analyzers, Photomultipliers, Oscilloscopes, West Germany

Lifetime measurements of optical levels are described and results for NaI, FeI, and ArII are given. The determination of lifetime is made by direct measurement of the light decay curve and by coindences from cascade transitions. (Author)

**AD-625 602 Fld. 7/4**
*NORTHWESTERN UNIV EVANSTON ILL DEPT OF CHEMISTRY*
**ANALYSIS OF RELAXATION PROCESSES IN A MULTILEVEL SYSTEM. A MANY-SHOT EXPANSION TECHNIQUE,**
by R. V. Serauskas, and E. W. Schlag. 3 Dec 64, 13p. Contract AF-AFOSR-524-64 Proj. AF-9760 Task 976002
AFOSR 65-1671
Unclassified report

Presented at the Meeting of the American Chemical Society (148th), Chicago, Ill., Sep 64, and at the Summer Session, Illinois Univ., 1963.

*Availability: Published in The Journal of Chemical Physics v42 n9 p3009-18 1 May 1965. Copies to DDC users only.*

Descriptors: (*Polyatomic molecules, Molecular energy levels), (*Relaxation time, Atomic energy levels), Electron transitions, Numerical methods, Procedures, Simulation, Monte Carlo method, Series

The relaxation of a gas of polyatomic molecules, excited to a particular energy is analyzed in terms of a random walk through all relevant energy states to yield the various stable products. The quantum yield is taken as the probability of forming a given one of these products. This relation problem is solved by means of an asymptotic, natural expansion in terms of the events in the process which are physically the most significant. The first term in this many-shot expansion is the strong collision result. For nearly strong collision processes and nonequilibrium system this many-shot expansion yields a rapidly converging series for an arbitrary ordered set of transition probabilities and hence consititutes a computationally useful solution to the Pauli master equation for such a nonequilibrium system. The relaxation problem is analyzed in terms of some assumed sets of collisional transition probabilities, including a model that assumes statistical equilibration of vibrational energy in every collision complex. (Author)

**AD-625 603 Fld. 7/4, 11/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**THE INVALIDITY OF A PURELY THERMODYNAMIC TREATMENT OF THE ADHESION OF SOLIDS,**
by S. S. Voyuskii, and B. V. Deryagin. 1965, 5p.
Rept. no. translation-2042
TT 66-60096
Unclassified report

Trans. of Kolloidnyi Zhurnal (USSR) v27 n4 p624-6 1965.

Descriptors: (*Solids, Adhesion), (*Adhesion, Theory), USSR, Adhesives, Polymers, Plastics, Substrates, Thermodynamics

In view of the appearance of a number of foreign papers where adhesion of polymer adhesives is treated in terms of wetting the present communication discusses the basic principles of the thermodynamics of adhesion. It has been pointed out that there is no direct relation between wetting and adhesion of a polymer to a solid. A critical discussion has been made of the theory of Sharp and Schonhorn who consider adhesion as due to a spreading of the polymer adhesive along the surface of a substrate and it has been shown that a purely thermodynamic approach to the adhesion of polymers to solids is invalid. (Author)

**AD-625 604 Fld. 7/4, 20/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*TUFTS UNIV MEDFORD MASS DEPT OF CHEMISTRY*
**DIELECTRIC DISPERSION.**
Quarterly status rept. no. 18, 1 Oct-31 Dec 65,
by Karl H. Illinger. 31 Dec 65, 3p. Contract Nonr-494 (19) Proj. NR-014 240
Unclassified report

See also AD-622 704.

Descriptors: (*Microwave spectroscopy, Spectrum analyzers), Microwave oscillators, Quantum mechanics, Broadband, Line spectrum, Frequency shift, Quadrupole moments

Construction of the 50-75 kmc (0.4 to 0.6 cm) broadband microwave spectrometer is in progress. Employing a backward-wave oscillator (operating in the range between 50 to 63 kmc) as a power source, the system is frequency stabilized by injection phase-locking with a harmonic derived from a crystal phase-lock frequency-stabilized system operating between 26.5 and 40 kmc. In an attempt to remove one of the inherent limitations of the generally employed impact-approximation theories of line broadening in the microwave region, namely the assumption of a classical path for the colliding particles, a treatment based upon the formalism of scattering theory was applied to the problem of the perturbation of rotational transitions. Calculations of the frequency shift of rotational lines were made. Molecular quadrupole moments for simple molecules were calculated.

**AD-625 639 Fld. 7/4, 20/2, 7/3**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY*
**THE CRYSTAL AND MOLECULAR STRUCTURE OF PENTAKIS (METHYLISONITRILE)-COBALT (I) PERCHLORATE,**
by F. A. Cotton, T. G. Dunne, and J. S. Wood.
21 Sep 64, 8p. Contract DA-ARO (D)-31-124-G328 AROD 3616:9
Unclassified report

*Availability: Published in Inorganic Chemistry v4 n3 p318-25 Mar 1965. Copies to DDC users only.*

Descriptors: (*Crystal structure, Metalorganic compounds), (*Molecular structure, Metalorganic compounds), (*Metalorganic compounds, Perchlorates), Cobalt compounds, Nitriles, Single crystals, Anisotropy, Symmetry (Crystallography), Valence, Chemical bonds, Least squares method, Molecular orbitals

The crystal and molecular structure of (Co (CNCH3)5) ClO4 has been determined by single crystal X-ray study with full-matrix least-squares refinement using anisotropic temperature parameters for all atoms. The space group is P3 (1)21 with Z = 3. The (Co (CNCH3)5) (+) ion has the shape of a trigonal bipyramid, slightly distorted due to intermolecular contacts. The shortness of the Co-C bonds, 1.87 = 0.015 vs. a value of 2.15 for a single bond, suggests Co-C bond orders of > or = 1.5. The very small deviation ( 3 = 1.5 degrees) of one CNC angle from 180 degrees is discussed in relation to the prediction of 180 degrees for the CNC angle by a molecular orbital description of the CoCNC bonding and the much greater deviation which would seem a likely prediction of the valence bond description. (Author)

**AD-625 643 Fld. 7/4, 20/2, 7/3**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY*
**CRYSTAL STRUCTURE OF TETRAMERIC COBALT (II) ACETYLACETONATE,**
by F. A. Cotton, and R. C. Elder. 22 Mar 65, 7p.
Contract DA-ARO (D)-31-124-G328 AROD 3616:8
Unclassified report

*Availability: Published in Inorganic Chemistry v4 n8 p1145-51 Aug 1965. Copies to DDC users only.*

Descriptors: (*Crystal structure, Metalorganic compounds), (*Metalorganic compounds, Acetones), Cobalt compounds, Esters, Chemical bonds, Single crystals, Molecular structure, Twinning (Crystallography)

As indicated previously, a structural analysis of CoII (AA)2 has been performed by X-ray crystal techniques. The triclinic unit cell contains one centrosymmetric tetramer. Octahedral coordination is achieved by sharing of oxygen atoms between cobalt atoms. The terminal cobalt atom is joined to the center pair by sharing a common octahedral face with three bridging oxygen atoms. The central two cobalt atoms are jointed by sharing an edge with only two bridging oxygen atoms. The bond lengths and angles found are those expected for such a structure. (Author)

**AD-625 646 Fld. 7/4**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY*
**INFRARED SPECTRA (1000-200/CM) OF SOME TRANSITION-METAL COMPLEXES WITH TERTIARY ARSINE OXIDES,**
by G. A. Rodley, D. M. L. Goodgame, and F. A. Cotton. 17 Jun 64, 7p. Contract DA-ARO (D)-31-124-G328 AROD 3616:7
Unclassified report

*Availability: Published in Journal of the Chemical Society v264 p1499-1505 Feb 1965. Copies to DDC users only.*

Descriptors: (*Complex compounds, Spectra (Infrared)), (*Oxides, Spectra (Infrared)), (*Arsenic compounds, Spectra (Infrared)), Organic oxygen compounds, Transition elements, Manganese compounds, Zinc compounds, Cobalt compounds, Copper compounds

The infrared spectra, in the region 1000--200/cm., of complexes of the type ML2X2, where L = Ph3AsO or Ph2MeAsO, X = Cl or Br, and M is a bivalent ion of the series Mn to Zn, are reported and discussed. The As-O stretching frequencies are in the range 910--840/cm. The bands due to the metal-donor atom stretching vibrations are assigned, and occur as follows: nu (M-O) 440--370, nu (M-Cl) 325--270, and nu (M-Br) 245--200/cm. These results are discussed in relation to the structures of the complexes. The compounds M (Ph3AsO)2Cl2, where M = Co or Zn, exist in two forms with differing infrared spectra and X-ray powder photographs. The electronic spectra of the complexes Cu (Ph3AsO)2X2, where X = Cl or Br, in the range 10,000--4000/cm. are reported, and the natures of these compounds, and also of the blue and the brown cuprous-cupric chloride complexes with Ph2MeAsO, are discussed. (Author)

**AD-624 875** See Fld. 7/3

**AD-624 881** See Fld. 20/10

**AD-624 933** See Fld. 20/4

**AD-624 954** See Fld. 14/2

**AD-625 044** See Fld. 21/2

**AD-625 077** See Fld. 7/2

**AD-625 127** See Fld. 10/2

AD-625 138 See Fld. 20/8

AD-625 146 See Fld. 7/2

AD-625 151 See Fld. 21/2

AD-625 153 See Fld. 20/12

AD-625 329 See Fld. 11/9

AD-625 330 See Fld. 11/9

AD-625 331 See Fld. 11/9

AD-625 337 See Fld. 20/6

AD-625 344 See Fld. 11/11

AD-625 345 See Fld. 11/11

AD-625 346 See Fld. 11/11

AD-625 364 See Fld. 20/10

AD-625 500 See Fld. 20/8

AD-625 546 See Fld. 20/2

AD-625 574 See Fld. 19/4

AD-625 582 See Fld. 21/2

AD-625 612 See Fld. 7/3

## 8/1. BIOLOGICAL OCEANOGRAPHY

**AD-624 971 Fld. 8/1**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**EXCITED OXYGEN ATOMS IN THE PHOTOLYSIS OF N20 AND N02,**
by R. J. Cvetanovic. 30 Apr 65, 2p. NRC 8633
Unclassified report

*Availability: Published in The Journal of Chemical Physics v43 n5 p1450-1 Sep 1 1965. Copies to DDC users only.*

Descriptors: (*Excitation, Oxygen), (*Photolysis, Nitrogen compounds), Atoms, Oxides

**AD-625 537 Fld. 8/1, 7/3**
*YALE UNIV NEW HAVEN CONN DEPT OF CHEMISTRY*
**CARBALKOXYNITRENES. THE PHOTOLYTIC DECOMPOSITION OF GASEOUS ALKYL AZIDOFORMATES,**
by Douglas W. Cornell, R. Stephen Berry, and Walter Lwowski. 12 Mar 65, 4p. Contract AF-AFOSR-183-63 AFOSR 65-2202
Unclassified report

Prepared in cooperation with Chicago Univ., Ill. Dept. of Chemistry and NIH.

*Availability: Published in Journal of the American Chemical Society v87 n16 p3626-9 Aug 20 1965. Copies to DDC users only.*

Descriptors: (*Formates, Photochemistry), (*Organic nitrogen compounds, Photochemistry), Organic oxygen compounds, Gases, Decomposition, Free radicals, Absorption spectrum

The photolytic decomposition of gaseous ethyl and methyl azidoformates was studied with regard to carbalkoxynitrene formation and other modes of decomposition. Chemical trapping and product analysis show that the nitrenes are produced when light is used whose energy is above about 95 kcal./mole, but below 130 kcal. Transient spectra show absorption by NCO. From the appearance time of NCO and the dependence of the NCO spectrum on partial pressure of a chemical trapping agent, limits on the nitrene lifetime are set at about 0.0000003 and 0.00003 sec. At higher photolysis energies transient N3 is also observed, and the product pattern indicates that a transient but unobserved CO2N3 may be present. (Author)

AD-624 884 See Fld. 20/12

AD-624 912 See Fld. 11/4

AD-625 218 See Fld. 7/3

AD-625 495 See Fld. 6/1

AD-625 638 See Fld. 7/3

## 8/2. CARTOGRAPHY

**AD-624 887 Fld. 8/2, 17/9, 9/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*ACADIA UNIV WOLFVILLE (NOVA SCOTIA)*
**RADAR AND GEOLOGY.**
Final rept., Feb 64-Feb 65,
by H. L. Cameron. 23 Jul 65, 27p. Contract AF19 (628)-4005 Proj. AF-7628,AF-8623 Task 762805 ,862302
AFCRL 65-202
Unclassified report

Descriptors: (*Mapping, Radar), (*Plan position indicators, Mapping), (*Geology, Mapping), Terrain, Geological survey, Structural geology, Ice, Photogrammetry, Photogeology, Canada, Great Britain

The topographic mapping possibilities of radar have been investigated almost since radar was developed. The geological interpretation of P.P.I. scope photography is discussed with possible explanations for the geological expression of certain features. The example of radar ice mapping is given and the radar geology of part of Eastern Canada described. The radar geology of Scotland is briefly described. The application of radar photography to the study of geological structures is recommended as a new and possibly unique method. (Author)

AD-625 217 See Fld. 5/10

## 8/3. DYNAMIC OCEANOGRAPHY

AD-624 933 See Fld. 20/4

AD-625 444 See Fld. 8/10

## 8/4. GEOCHEMISTRY

**AD-625 258 Fld. 8/4, 22/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY ENGINEER GEODESY INTELLIGENCE AND MAPPING RESEARCH AND DEVELOPMENT AGENCY FORT BELVOIR VA*
**RESULTS OF SPACE TRIANGULATION ADJUSTMENTS FROM SATELLITE DATA.**
Research note,
by Armando Mancini, and Lawrence A. Gambino. Sep 65, 29p. Rept. no. gimrada-RN-13
Proj. DA-4A013001A91D
Unclassified report

Presented at the International Symposium, The use of Artificial Satellites for Geodesy (2nd), Athens, Greece, 26-30 Apr 65.

Descriptors: (*Astronomical geodesics, Satellites (Artificial)), (*Satellites (Artificial), Astronomical geodesics), Optical tracking, Position finding, Trigonometry, Geodesics

Simultaneous optical observations from the beta mu-11962 satellite have been used to calculate the threedimensional orientation and geodetic azimuths of lines ranging from 400 km to 1600 km in length. These directions were subsequently used as input to a conventional first-order triangulation adjustment and a three-dimensional surface adjustment to establish the geodetic positions of the camera sites. It is concluded from this study that the station-to-station directions can be computed within an accuracy of 0.7 sec for the three-dimensional fix and to within 0.5 sec for the geodetic azimuth. The conventional and three-dimensional adjustments produce an average root-mean-square error of 6 m in position. (Author)

**AD-625 356 Fld. 8/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY ENGINEER GEODESY INTELLIGENCE AND MAPPING RESEARCH AND DEVELOPMENT AGENCY FORT BELVOIR VA*
**REDUCTION PROCEDURES FOR ABSOLUTE DIRECTION AND GEODETIC AZIMUTHS FROM OPTICAL OBSERVATIONS OF SATELLITES.**
Research note,
by Lawrence A. Gambino, and Armando Mancini. Oct 65, 25p. Rept. no. gimrada-RN-14
Proj. DA-4A013001A91D
Unclassified report

Descriptors: (*Astronomical geodesics, Matrix algebra), (*Matrix algebra, Astronomical geodesics), Satellites (Artificial), Optical tracking, Position finding, Geodesics, Data processing systems, Numerical methods and procedures

The azimuth reduction technique from satellite data presented in this report is developed with the aid of matrix algebra. It is fully general in that provisions are made for correlated observations. The reductions represent a rigorous least squares approach to the reduction of optical data gathered from satellite observations. The matrix equations are outlined in such a fashion that they can easily be used in the development of computer programs to perform azimuth reductions from simultaneous observations of satellites from two widely separated ground stations. (Author)

## 8/5. GEODESY

**AD-625 314 Fld. 8/5, 8/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF GEOLOGY AND GEOPHYSICS*
**GEOCHEMISTRY OF IODINE, BROMINE, AND CHLORIDE IN THE AIR-SEA-SEDIMENT SYSTEM,**
by John W. Winchester, and Robert A. Duce. 1965, 18p.
Unclassified report

Symposium on Marine Geochemistry p185-201.

Descriptors: (*Geochemistry, Halogens), (*Halogens, Geochemistry), Iodine, Bromine, Chlorine, Sedimentation, Marine geology

**AD-625 347 Fld. 8/5, 8/7**
**CFSTI Prices: HC $5.00 MF $1.00**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF GEOLOGY AND GEOPHYSICS*
**RARE EARTH DISTRIBUTIONS IN THE MARINE ENVIRONMENT.**
Doctoral thesis,
by Regina Volfovsky Spirn. Sep 65, 176p. Contract Nonr-1841 (74) Proj. NR-083-157
Unclassified report

Descriptors: (*Rare earth elements, Marine geology), (*Marine geology, Rare earth elements), (*Geochemistry, Rare earth elements), Yttrium, Sedimentation, Ocean bottom sampling, Indian Ocean, Atlantic Ocean, Antarctic regions, Tracer studies, Neutron activation, Chromatographic analysis, Radioactivation analysis

A procedure for determination of the rare earth elements and yttrium utilizing tracer-monitored group separation, neutron activation and carrier-free partition chromatography has been developed. Using this procedure a survey of rare earths and yttrium (=RE) abundances in different types of matter from the marine environment was made. The RE distributions in these samples and in the limited number of marine and sedimentary materials in which RE distributions had been determined previously were compared. The majority of whole-core RE distributions are rather uniform, but in core components of different genesis they are different. More than half the RE content of marine clay is apparently adsorbed on the clay particle surfaces, and the distribution of the adsorbed RE can be quite different or quite similar to that in the interior. The RE content in calcareous parts of organisms varies over more than an order of magnitude and the possibility was indicated that in fresh calcareous structures the larger part of the RE occurs in the organic components and that in sedimented old calcareous material a great part of the RE content is post-depositionally adsorbed. RE distributions in live organic matter appear to differ greatly from those in old organic remains.

**AD-625 447 Fld. 8/5, 13/2**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA*
**CONCENTRATIONS OF COMMON LEAD IN GREENLAND SNOWS,**
by M. Murozumi, T. J. Chow, and C. Patterson. 1965, 5p. Contract Nonr-2216 (23) Proj. NR-083-005

Unclassified report

*Availability: Published in Symposium on Marine Chemistry, Narragansett Marine Laboratory, Graduate School of Oceanography, RHode Island Univ. Occasional pub. no. 3-1965 p213-5. Copies to DDC users only.*

Descriptors: (*Lead, Air pollution), (*Air pollution, Lead), Greenland, Combustion products, Hydrocarbons, Exhaust gases, Aerosols, Snow, Geochemistry

**AD-625 448 Fld. 8/5, 18/8**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA*
**RADIOGENIC LEADS OF THE CANADIAN AND BALTIC SHIELD REGIONS,**
by Tsaihwa J. Chow. 1964, 18p. Contract Nonr-2216 (23) Proj. NR-083-005

Unclassified report

*Availability: Published in Symposium on Marine Geochemistry, Narragansett Marine Laboratory, Graduate School of Oceanography Rhode Island Univ. Occasional pub. no. 3-1965, p169-84. Copies to DDC users only.*

Descriptors: (*Geochemistry, Lead), (*Lead, Geochemistry), Marine geology, Radioactive isotopes, Sedimentation, Arctic regions

The geochemical significance of the lead isotopes in the sediments derived from the Canadian and Baltic Shields is discussed.

## 8/6. GEOGRAPHY

**AD-625 426 Fld. 8/6**
**CFSTI Prices: HC $8.15 MF $2.25**
*TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV*
**AN INVENTORY OF GEOGRAPHIC RESEARCH OF THE HUMID TROPIC ENVIRONMENT. VOLUME I. KWIC INDEX. HUMID TROPIC ENVIRONMENTAL LITERATURE,**
by Harvey Vogel. Dec 65, 515p. Contract DA-49-092-ARO-33

Unclassified report

Descriptors: (*Tropical regions, Geography), (*Geography, Tropical regions), (*Humidity, Tropical regions), Subject indexing, Bibliographies, Geology, Hydrology, Soils, Plants (Botany), Animals, Meteorology, Climatology, Africa, Asia, South America, Central America, Pacific Ocean islands, Ecology

Humid Tropic Environmental literature has been collected at domestic and foreign depositories to aid in the determination of an inventory of geographic research of the humid tropic environment. Documents were screened, abstracted and placed in data processing format for various program tasks. The collected bibliography is presented in a KWIC Index for rapid searching by users. The KWIC Index contains 14,515 documents, 9,170 authors and 58,830 keywords. It appears in five sections: A-Frequency of Stop Words; B-Frequency of OK words; C-Author Listing and Index; D-Keyword listing and Index, and E-Bibliographic Listing and Index. The last section (E) is arranged in geographic, subject and author order. Approximately 10 percent of the documents are abstracted. Documents of military significance or of great scientific value are indicated. Materials are derived primarily from the literature of the following disciplines: Geographical, Earth, Atmospheric, and Biological Sciences. (Author)

**AD-625 427 Fld. 8/6, 4/2**
**CFSTI Prices: HC $6.00 MF $1.25**
*MCGILL UNIV MONTREAL (QUEBEC) DEPT OF GEOGRAPHY*
**DIRECTORY OF INSTITUTIONS PRIMARILY DEVOTED TO HUMID TROPICS RESEARCH,**
by Theo. L. Hills. 1965, 237p. Contract DA-ARO-49-092-65-G75

Unclassified report

Prepared for International Geographical Union, Humid Tropics Commission.

Descriptors: (*Tropical regions, Scientific research), (*Humidity, Tropical regions), (*Scientific research, Directories), Canada

The Directory provides information about 583 institutions which are located in 83 countries and dependent territories, both tropical and extratropical. (Author)

## 8/7. GEOLOGY AND MINERALOGY

**AD-625 165 Fld. 8/7**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB*
**SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARY CHONDRITES.**
Environmental research papers; revised ed.,
by Robert T. Dodd,Jr., and Randall Van Schmus. 27 Apr 65, 21p. Rept. no. erp-145
Proj. AF-8602 Task 860205
AFCRL 65-744

Unclassified report

Revision of manuscript submitted 13 Feb 65.

*Availability: Published in Journal of Geophysical Research v70 n16 p3801-11 15 Aug 1965. Copies to DDC users only.*

Descriptors: (*Minerals, Meteorites), (*Petrology, Meteorites), (*Meteorites, Petrology), Extraterrestrial topography, Phase studies, Igneous rock, Metamorphic rock, Silicates, Geochemistry

Olivine compositions of thirteen olivine-hypersthene and olivine-bronzite chondrites, chosen for their apparent freedom from recrystallization, were determined with an electron microprobe. A parallel petrographic study of these samples, and five others in which Keil and Fredriksson found variable olivine compositions, was used to relate the extent of variation in each sample to textural characteristics. Large variations in olivine composition occur in all of the chondrites examined in which (1) intergrowth between chondrules and matrix is absent or very slight and (2) clear, brown mafic glass occurs in the matrices of barred and porphyritic chondrules. Smaller variations occur in samples which show slightly greater intergrowth of the chondrules and matrix and in which microcrystalline material occurs in place of glass. Dispersion of olivine compositions is absent from samples which contain petrographic evidence of substantial recrystallization. Variations in olivine composition and the presence of mafic glass appear to be characteristic of the least-altered chondrites and are probably characteristic of the material from which the chondrites formed. (Author)

**AD-625 308 Fld. 8/7, 8/10**
*LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y*
**FREE VIBRATIONS OF THE EARTH AND THE PROPERTIES OF ITS DEEP INTERIOR REGIONS. PART I. DENSITY.**
Scientific rept.,
by M. Landisman, Y. Sato, and J. Nafe. 1965, 70p. Rept. no. 703 ,Scientific-47
Contract AF19 (604)-7376 ,ARPA Order-292
Proj. 8652 ,VELA-UNIFORM Task 865203
AFCRL 65-792

Unclassified report

*Availability: Published in Geophysical Journal of the Royal Astronomical Society v9 n5 p439-502 1965. Copies to DDC users only.*

Descriptors: (*Earth (Planet), Density), Seismology, Geophysics

Density in the Earth has been determined by a new method. This new density is based on the following independent sets of data: periods of torsional and spheroidal free oscillations; travel times of P and S waves; total mass; moment of inertia derived from the satellite value of flattening. Alteration of density rather than shear velocity in the lower mantle has been made in order to satisfy both observations of free oscillations and of S wave travel times. Densities are very close to the Bullen A distribution down to depths of about 500 km, slightly lower to 1100 km and then slightly higher to 1800 km depth. The region between depths of 1600 km and 2800 km was found to have essentially constant density. The super-adiabatic temperature gradient of about 2C/km, combined with a depletion of iron in the high temperature region of the lower mantle is a possible explanation of this result. The mass removed from the mantle has been transferred to the core. The resulting outer core densities are about 2 per cent higher than those of the Bullen A model; the central density is about 15.42 g/3cc. (Author)

**AD-625 393 Fld. 8/7, 3/2, 22/1**
**CFSTI Prices: HC $4.00 MF $1.00**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**THE RESPONSE OF SELECTED ROCK SPECIMENS TO VACUUM ULTRAVIOLET LIGHT.**
Masters' thesis,
by William D. Dupee. Aug 65, 148p. Rept. no. gsf/mech-65-43

Unclassified report

Descriptors: (*Ultraviolet spectroscopy, Rock (Geology)), (*Rock (Geology), Ultraviolet spectroscopy), (*Petrology, Ultraviolet spectroscopy), Optical analysis, Igneous rocks, Reflection, Monochromatic light, Ultraviolet radiation, Minerals, Geochemistry, Extraterrestrial topography, Lunar probes, Ultraviolet equipment

This is a report on an investigation of the reflectance of selected igneous rocks irradiated by light in the spectral range from 550 to 1800 A. The effect of ultraviolet light upon atoms and molecules is discussed, and Maxwell's equations are used in a classical analysis of the optical properties of

solids. This analysis shows that the optical properties are functions of the light wave frequency. A one-meter vacuum ultraviolet scanning monochrometer with a capillary discharge type light source was used in irradiating the rock specimens. Commercial helium was used as the source gas. Experimental analysis of the reflectance properties was approached by calculating the intensity ratio of the 584 A line to the 1216 A line and the 1167 A line to the 1304 A line for the reflected light recordings of each rock type. These reflected intensity ratios were then compared to the corresponding intensity ratios for the incident light spectrum. It was found that almost all of the rocks examined tend to exhibit higher reflectivity at shorter wavelengths. Furthermore, it appears that each rock type has a characteristic response related to the chemical composition. (Author)

**AD-625 449 Fld. 8/7, 8/10**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA*
**STRUCTURE OF THE CONTINENTAL MARGIN OFF CENTRAL CALIFORNIA,**
by Joseph R. Curray. 1965, 10p. Contract Nonr-2216 (23) Proj. NR-083-005
Unclassified report

*Availability: Published in transactions of the New York Academy of Sciences (Ser2) v27 n7 p794-801 May 1965. Copies to DDC users only.*

Descriptors: (*Structural geology, California), (*Marine geology, California), Exploration, Sound, Reflection, Seismology

The structural framework of the continental margin off central California has been determined by means of acoustic reflection to consist of thick accumulations of shelf and slope deposits over and behind a basement ridge, locally known to be granitic. Where this ridge is deeply buried, a wide and presumably thick continental rise has formed. Large scale sliding has locally modified steeper portions of the continental slope, especially seaward of the basement ridge. This structure differs in degree of development, not in basic kind, from the east coast of the United States. (Author)

**AD-625 347 See Fld. 8/5**

## 8/8. HYDROLOGY AND LIMNOLOGY

**AD-624 898 Fld. 8/8, 12/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*MICHIGAN STATE UNIV EAST LANSING DEPT OF STATISTICS*
**ON THE INDEPENDENCE OF YEARLY WATER INPUTS IN DAMS.**
Technical rept.,
by R. R. Bhat, and J. Gani. Oct 65, 15p. Rept. no. msu-RM-147 JG-9
Contract Nonr-2587 (05) Grant ,PHS-GM-13138-01
Unclassified report

Prepared in cooperation with Sheffield Univ. (England), Rept. no. RR-2/JG-2 and Karnatak Univ.

Descriptors: (*Dams, Water supplies), (*Water supplies, Dams), Hydrology, Statistical analysis, Probability, Rivers, Australia

This paper considers the assumption in Moran's theory that the yearly water inputs into a reservoir are independently distributed. To test this hypothesis, two models are constructed for the annual discharges of 17 Australian rivers. The first, a Markov process with normal residuals, leads to the tentative conclusion that discharges from most of the rivers can only approximately be regarded as serially independent. From the second model, a simple Markov chain, it is shown that for runs of from 58 to 72 years, no reliable conclusion can be drawn. (Author)

## 8/10. PHYSICAL OCEANOGRAPHY

**AD-625 237 Fld. 8/10, 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*LITTLE (ARTHUR D) INC CAMBRIDGE MASS*
**INTERNAL WAVES BIBLIOGRAPHY.**
ASW sonar technology rept.
Sep 65, 30p. Rept. no. 4030965
Contract NObsr-93055 Proj. SF-101-03-21 Task 11353
Unclassified report

Descriptors: (*Ocean waves, Bibliography), (*Fluid mechanics, Ocean waves), Oceanology, Underwater, Acoustics, Military requirements

This bibliography has been prepared as a part of a study of the military implications of internal waves. It includes all papers concerning internal waves in the ocean given a wide distribution in the United States. Papers given limited distribution have been included when possible. Undoubtedly, many papers concerning references to internal waves or data which can be interpreted in terms of internal waves exist that are not included, however, this bibliography is believed to be complete with respect to papers dealing primarily with internal waves in the oceans. Entries are arranged in alphabetical order by author and date of publication. (Author)

**AD-625 444 Fld. 8/10, 8/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS*
**CRUISE PLANS FOR R/V CHAIN CRUISE NO. 43, INDIAN OCEAN EXPEDITION.**
Technical memo.,
by Elizabeth T. Bunce. Jan 64, 15p. Rept. no. tm-1-64
Contract Nonr-4029 (00) Grant ,NSF-G2370
Unclassified report

Descriptors: (*Oceanology, Indian Ocean), (*Indian Ocean, Oceanology), Scientific research, Research program administration

The proposed cruise of R/V CHAIN to the Indian Ocean will take place from February to June 1964. The background and objectives of the scientific program in the Indian Ocean are detailed in the research proposal submitted to the National Science Foundation.

**AD-625 450 Fld. 8/10**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA*
**ISOTOPIC OCEANOGRAPHY: DEUTERIUM AND OXYGEN 18 VARIATIONS IN THE OCEAN AND THE MARINE ATMOSPHERE,**
by H. Craig, and L. I. Gordon. 1965, 99p. Contract Nonr-2216 (23)
Unclassified report

*Availability: Published in Symposium on Marine Geochemistry, Narragansett Marine Lab., Graduate School of Oceanography, Univ. of Rhode Island, Occasional pub-3 p277-374 1965. Copies to DDC users only.*

Descriptors: (*Deuterium, Oceanographic data), (*Oxygen, Oceanographic data), (*Oceanology, Geochemistry), Isotopes, Sea water, Atmosphere

**AD-625 179 See Fld. 7/4**

**AD-625 308 See Fld. 8/7**

**AD-625 314 See Fld. 8/5**

**AD-625 449 See Fld. 8/7**

## 8/11. SEISMOLOGY

**AD-625 006 Fld. 8/11, 17/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*VELA SEISMIC INFORMATION ANALYSIS CENTER UNIV OF MICHIGAN ANN ARBOR*
**VESIAC MONTHLY BULLETIN OF VELA UNIFORM RESEARCH PUBLICATIONS,**
15 Oct 65, 11p. Rept. no. Bull-33
Unclassified report

See also AD-623 184.

Descriptors: (*Seismology, Periodicals), Bibliographies, Seismic waves, Earthquakes, Wave transmission, Structural geology

**AD-625 221 Fld. 8/11, 17/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*VELA SEISMIC INFORMATION ANALYSIS CENTER UNIV OF MICHIGAN ANN ARBOR*
**VESIAC MONTHLY BULLETIN OF VELA UNIFORM RESEARCH PUBLICATIONS.**
15 Nov 65, 19p. Rept. no. bull-34
Unclassified report

See also AD-625 006.

Descriptors: (*Seismology, Periodicals), Bibliographies, Seismic waves, Earthquakes, Structural geology, Nuclear explosions, Wave transmission

**AD-625 399 Fld. 8/11**
**CFSTI Prices: HC $2.00 MF $0.75**
*GEOTECHNICAL CORP GARLAND TEX*
**LONG RANGE SEISMIC MEASUREMENTS. PROJECT 8.4. NEW MADRID EARTHQUAKE.**
7 Nov 62, 43p. Proj. VELA-UNIFORM
Unclassified report

Descriptors: (*Seismology, Earthquakes), (*Earthquakes, Missouri), Epicenter, Seismic waves, Velocity, Graphics

This report presents the seismic data obtained from a preliminary analysis of seismograms of the NEW MADRID, Missouri, earthquake of 2 February 1962. The data were recorded by the teams operating in the Long-Range Seismic Measurements (LRSM) Program (established under VELA-UNIFORM Project 8.4) and by the Wichita Mountains Seismological Observatory (WMSO). (Author)

**AD-625 460 Fld. 8/11, 17/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX*
**OPERATION OF TWO OBSERVATORIES.**
Quarterly rept. no. 1, 1 May-31 Jul 65.
31 Jul 65, 43p. Rept. no. tr-65-99
Contract AF33 (657)-12373 ,ARPA Order-624
Proj. AFTAC-VT/5054
Unclassified report

Descriptors: (*Seismological stations, Instrumentation), Seismology, Data processing systems, Operation, Specifications, Earthquakes, Seismic waves, Nuclear explosions, Detection, Oregon, Utah

This report describes the operation of the Blue Mountains Seismological Observatory and Unita Basin Seismological Observatory between the period of 1 May through 31 July 1965. Modifications and additions to the observatory instrumentation are described and tests to improve the operation of the observatories are reported. Also discussed in this report is the progress of special investigations designed to evaluate and improve the detection capacity of the observatories. (Author)

**AD-625 461 Fld. 8/11, 17/10**
**CFSTI Prices: HC $3.00 MF $0.75**

*GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX*
**OPERATION OF TWO OBSERVATORIES.**
Quarterly rept. no. 2, 1 Aug-31 Oct 65.
31 Oct 65, 61p. Rept. no. tr-65-128
Contract AF33 (657)-12373 ,ARPA Order-624
Proj. AFTAC-VT/5054

Unclassified report

See also AD-625 460.

Descriptors: (*Seismological stations, Instrumentation), Seismology, Data processing systems, Operation, Specifications, Earthquakes, Nuclear explosions, Seismic waves, Detection, Oregon, Utah

This report describes the operation of the Blue Mountains Seismological Observatory and Uinta Basin Seismological Observatory during the period of 1 August through 31 October 1965. Modifications and additions to the observatory instrumentation are described and tests to improve the operation of the observatories are reported. Also discussed is the progress of special investigations designed to evaluate and improve the detection capacity of the observatories. (Author)

**AD-625 462 Fld. 8/11**
**CFSTI Prices: HC $3.00 MF $0.75**
*GEOTECHNICAL CORP GARLAND TEX*
**OPERATION OF THE WICHITA MOUNTAINS SEISMOLOGICAL OBSERVATORY.**
Semiannual rept. no. 2, 1 Dec 64-31 May 65.
8 Jun 65, 77p. Rept. no. tr-65-52
Contract AF33 (657)-13562, ARPA Order-104
Proj. AFTAC-VT/4054

Unclassified report

Descriptors: (*Seismological stations, Oklahoma), Seismology, Recording systems, Data processing systems, Specifications, Earthquakes, Seismic waves, Propagation

This project includes the operation, evaluation, and improvement of the Wichita Mountains Seismological Observatory (WMSO) located on the Fort Sill Military Reservation in southern Oklahoma. The purpose of WMSO is threefold. First, the standard instrumentation of the observatory is maintained and continually evaluated and seismometric data are recorded, analyzed, and reported to the United States Coast and Geodetic Survey (USC and GS) daily. Second, WMSO is used as a field laboratory where new instruments and techniques are tested and evaluated to determine their value for use at an observatory. Third, the data recorded at WMSO are studied, separately and in conjunction with data from other observatories, in an effort to improve and refine interpretive techniques and to learn more about earthquake mechanisms and the mechanisms of propagation of seismic waves through the earth.

**AD-625 464 Fld. 8/11**
**CFSTI Prices: HC $6.00 MF $1.25**
*UNITED ELECTRODYNAMICS INC PASADENA CALIF*
**TONTO FOREST SEISMOLOGICAL OBSERVATORY.**
Final rept., 17 Nov 61-30 Apr 65,
by P. S. Klasky, G. F. Francis, O. R. Russell, and H. W. Russell. 25 Jun 65, 236p. Rept. no. ued-371-1665-0026

Unclassified report

Descriptors: (*Seismological stations, Arizona), Seismology, Instrumentation, Construction, Specifications, Seismometers, Data processing systems

The Tonto Forest Seismological Observatory (TFSO) is the largest and most versatile observatory operating under the VELA UNIFORM Program. The Arizona site was chosen for its low ambient noise characteristics. It has been determined that under optimum conditions there is a 90% probability of detecting a magnitude 3.5 earthquake at a distance of 75 degrees. The array configuration includes a complement of 46 vertical and 26 horizontal short-period J-M seismometers, three 3-component sets of long-period and intermediate-band seismometers, two sets of 3-component short-period Benioff and two Wood-Anderson seismometers. The array of seismometers and Observatory are located in a tree-covered area six miles square near Payson, Arizona, on U. S. National Forest land. Phototube amplifiers are used for amplification and are supplemented by low impedance output isolation amplifiers which allow complete versatility of operation with any number of recorders for either routine or experimental programs. The TFSO also contains facilities for seismic system development and evaluation such as a complete machine shop, vertical shake table, large engineering laboratory for use of visiting VELA contractors, a large underground vault, area 1100 square feet, for experimental work.

**AD-625 467 Fld. 8/11, 17/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*GEOTECHNICAL CORP GARLAND TEX*
**OPERATION OF THE TONTO FOREST SEISMOLOGICAL OBSERVATORY.**
Quarterly rept. no. 1, 1 May-31 Jul 65.
10 Aug 65, 40p. Rept. no. tr-65-96
Contract AF33 (657)-14444 ,ARPA Order-624
Proj. AFTAC-VT/5055

Unclassified report

Descriptors: (*Seismological stations, Instrumentation), Arizona, Seismology, Data processing systems, Operation, Specifications, Earthquakes, Nuclear explosions, Seismic waves, Detection

This is a report of the work accomplished on Project VT/5055 from 1 May through 31 July 1965. Project VT/5055 includes the operation, evaluation, and improvement of the Tonto Forest Seismological Observatory (TFSO) located near Payson, Arizona. It also includes special sesmological investigations using data derived from eight Long Range Seismic Measurements Project (LRSM) seismological stations. (Author)

**AD-625 469 Fld. 8/11**
**CFSTI Prices: HC $3.00 MF $0.50**
*GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX*
**OPERATION OF TFSO.**
Quarterly rept. no. 2, 1 Aug-31 Oct 65.
12 Nov 65, 53p. Rept. no. tr-65-129
Contract AF33 (657)-14444 ,ARPA Order-624
Proj. AFTAC-VT-5055

Unclassified report

Descriptors: (*Seismological stations, Arizona), Seismology, Recording systems, Data processing systems, Specifications, Earthquakes, Seismic waves, Propagation

Project VT/5055 includes the operation, evaluation, and improvement of the Tonto Forest Seismological Observatory located near Payson, Arizona. It also includes a discussion of special seismological investigations using data recorded by eight Long-Range Seismic Measurements Project seismological stations operating in an extended array configuration around the observatory. (Author)

**AD-625 491 Fld. 8/11, 14/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV*
**MULTIPLE ARRAY PROCESSOR.**
Quarterly rept. no. 2, 1 Jan-31 Mar 65.
25 Apr 65, 4p. Contract AF33 (657)-13904,
ARPA Order-104 Proj. AFTAC-VT/5052

Unclassified report

Descriptors: (*Seismological stations, Data processing systems), Seismology, Instrumentation, Nuclear explosions, Detection, Arizona

**AD-625 514 Fld. 8/11, 17/10**
**CFSTI Prices: HC $6.00 MF $1.25**
*GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX*
**DEEP-WELL RESEARCH.**
Semiannual rept. no. 2.
24 Aug 65, 220p. Rept. no. tr-65-112
Contract AF33 (657)-13668,ARPA Order-104-60 Proj. AFTAC-VT/5051

Unclassified report

Descriptors: (*Seismological stations, Underground structures), (*Underground structures, Seismological stations), Seismology, Underground, Seismometers, Design, Specifications, Signal-to-noise ratio, Microseisms, Seismic waves

A deep-hole vertical array of six short-period seismometers was tested at Grapevine, Texas. The results indicated that the array performed satisfactorily. An array of four seismometers was then operated routinely in a deep hole near Apache, Oklahoma, to record noise and signals. A deep-hole triaxial seismometer was constructed and tested. The results of the test program indicated that minor design modifications were required before the instrument would be ready for routine use. A long-period response was obtained from a short-period deep-hole seismometer by the use of filters and amplifiers. The resultant system was capable of operation at a magnification greater than 50,000 at 0.04 Hz and did not appear to be limited by system noise at that magnification. Routine measurements of noise and signals in deep holes were made at sites in Oklahoma, Texas, and West Virginia. The measurements were used in a theoretical study program designed to increase understanding of the nature of noise and signals. Effort was expended to define optimum processing techniques for signals recorded from both triaxial and vertical seismometers. The results of this effort will lead to an optimum on-line processor for routine field use. (Author)

**AD-625 515 Fld. 8/11, 17/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX*
**DEEP-WELL RESEARCH.**
Quarterly rept. no. 1.
15 Oct 65, 31p. Rept. no. tr-65-119
Contract arpa-Order-624 Proj. AFTAC-VT-5051

Unclassified report

See also AD-625 514.

Descriptors: (*Seismological stations, Underground structures), (*Underground structures, Seismological stations), Seismology, Underground, Seismometers, Sensitivity, Signal-to-noise ratio, Seismic waves, Microseisms

Vertical arrays of four vertical seismometers were operated in the deep hole at sites near Apache, Oklahoma, and Franklin, West Virginia. At each site a fifth deep-hole seismometer was operated in a shallow hole adjacent to the deep hole as a surface reference. The deep hole near Apache was filled with water to within 75 m of the surface. Measurements at this site were interrupted when the hole was filled and have not resumed. Design improvements to the deep-hole, short-period triaxial seismometer were completed. A vertical array of up to four triaxial seismometers in one hole was designed and is under construction. The normal response of the deep-hole vertical seismograph was modified to peak at higher frequencies by use of a 10-cps galvanometer and auxiliary-filter amplifiers. Also, work was done to extend the response of both the vertical and the triaxial seismographs to provide long-period responses peaked near 20 seconds. The test site near Grapevine, Texas was maintained in operation to perform tests and experiments on the triaxial seismometer. Additionally, seismographs with special responses were tested there. Results of data analyses indicate that

changes in the shear velocities assumed in the Rayleigh wave computer program do not appreciably change the amplititude-depth relationships. Spectral analyses of teleseismic P waves indicate that enough S-wave energy is present to degrade the filters that eliminate the surface reflections. Several examples of the results of attempts to eliminate the surface reflections are shown; results are good for the first few cycles. (Author)

**AD-625 516 Fld. 8/11, 17/10**
**CFSTI Prices: HC $7.00 MF $1.50**
*GEOTECHNICAL CORP GARLAND TEX*
**OPERATION OF THREE OBSERVATORIES.**
Semiannual rept. no. 3 (Final rept.) 1 Jul 63-30 Apr 65.
1 Jul 65, 334p. Rept. no. tr-65-58
Contract AF33 (657)-12373 ,ARPA Order-104-60 Proj. AFTAC-VT/1124

Unclassified report

Descriptors: (*Seismological stations, Instrumentation), Oregon, Tennessee, Utah, Seismology, Data processing systems, Operation, Specifications, Earthquakes, Nuclear explosions, Detection

The operation of the Blue Mountains Seismological Observatory, Cumberland Plateau Seismological Observatory, and Uinta Basin Seismological Observatory between 1 July 1963 and 30 April 1965 is discussed in this report. Modifications and additions to the observatory instrumentation are described and tests to improve the operation of the observatories are reported. Also discussed in the report is the progress of special investigations designed to evaluate and improve the detection capability of the observatories. (Author)

**AD-625 518 Fld. 8/11, 17/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*GEOTECHNICAL CORP GARLAND TEX*
**MULTICOMPONENT STRAIN SEISMOGRAPH.**
Quarterly rept. no. 1, 1 Jul-30 Sep 65.
14 Oct 65, 9p. Rept. no. tr-65-120
Contract AF33 (657)-15288 ,ARPA Order-624 Proj. AFTAC-VT/5081

Unclassified report

Descriptors: (*Seismographs, Strain (Mechanics)), (*Strain (Mechanics), Seismographs), Seismology, Seismometers, Seismic waves, Microseisms, Data processing systems

Work was directed toward five main objectives. They were: (a) To obtain equal phase and amplitude response on the vertical strain and vertical inertial seismograph to measure phase, coherence, and spectra of the seismic noise at WMSO; (b) To evaluate P-wave enhancement by cancelling microseisms using vertical strain and vertical inertial seismographs, and by utilizing the directional properties of the horizontal strain array; (c) To verify a possible 6 dB loss of signal in the vertical strain seismometer; (d) To start a retrofit of strain instrumentation and strain facilities at WMSO; (e) To set up the data channels required for digital recording by Texas Instruments, Inc. (Author)

**AD-625 545 Fld. 8/11, 9/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*UED EARTH SCIENCES DIV TELEDYNE INC ALEXANDRIA VA*
**SEISMIC DATA LABORATORY.**
Semi-annual technical summary rept. no. 7, Oct 64-Mar 65,
by Robert Van Nostrand. 15 Apr 65, 71p. Contract AF33 (657)-12447 ARPA ,Order-624 Proj. VELA-T/2037

Unclassified report

Descriptors: (*Seismology, Data processing systems), (*Data processing systems, Seismology), (*Analysis of variance, Seismology), Earthquakes, Nuclear explosions, Seismic waves, Detection, Programming (Computers)

The purpose of the work has been to give a technical evaluation of the analysis of variance as a method of automatic signal detection. The analysis of variance has been programmed for the digital computer and the resulting program may be considered an array processor for the purpose of signal detection only.

**AD-625 547 Fld. 8/11, 9/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*UED EARTH SCIENCES DIV TELEDYNE INC ALEXANDRIA VA*
**SEISMIC DATA LABORATORY.**
Quarterly technical summary rept. no. 1, Apr-Jun 65,
by Robert G. Van Nostrand. 15 Jul 65, 37p. Contract AF33 (657)-12447 ,ARPA Order-624 Proj. VELA-T/2037

Unclassified report

See also AD-625 545.

Descriptors: (*Seismology, Data processing systems), (*Data processing systems, Seismology), Earthquakes, Nuclear explosions, Seismic waves, Detection, Numerical analysis

The report presents the results of a preliminary investigation into the application of partial coherency techniques to the problem of processing seismic data.

**AD-625 552 Fld. 8/11, 17/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV*
**CUMBERLAND PLATEAU SEISMOLOGICAL OBSERVATORY.**
Quarterly rept. no. 1, 1 May-31 Jul 65,
by P. J. Farrell. 15 Aug 65, 27p. Contract AF33 (657)-14648 ,ARPA Order-624 Proj. AFTAC-VT/5054

Unclassified report

Descriptors: (*Seismological stations, Tennessee), Seismology, Instrumentation, Seismic waves, Detection, Seismometers, Specifications, Earthquakes, Nuclear explosions

The observatory is operated for the Air Force Technical Applications Center (AFTAC) under the sponsorship of the advanced Research Projects Agency (ARPA) as part of program VELA UNIFORM. During these first three months of operation, routine analysis and operation of the station has continued and specific research studies on ambient noise, signal-to-noise ratios and detection capability have been initiated. In addition, a digital multichannel filter unit is being built by TI for installation early in 1966. This first quarterly progress report reviews the analysis, engineering and research tasks which have been performed or initiated during May, June and July of 1965. (Author)

**AD-625 553 Fld. 8/11, 17/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV*
**CUMBERLAND PLATEAU SEISMOLOGICAL OBSERVATORY.**
Quarterly rept. no. 2, 1 Aug-31 Oct 65,
by Harry R. Lake, James P. Edwards,III, AND Dale P. Glover. 15 Nov 65, 27p. Contract AF33 (657)-14648 ARPA ,Order-624 Proj. AFT-VT/5054

Unclassified report

See also AD-625 552.

Descriptors: (*Seismological stations, Tennessee), Seismology, Instrumentation, Specifications, Earthquakes, Nuclear explosions, Seismic waves, Detection

The report reviews the analysis, engineering and research tasks which have been performed or initiated during August, September and October of 1965. During this second 3-month period of the contract, routine operations and analysis have continued at CPSO. The research tasks involving ambient noise studies, signalto-noise ratio studies and detection capability are advancing smoothly.

**AD-625 555 Fld. 8/11, 14/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV*
**MULTIPLE ARRAY PROCESSOR.**
Quarterly rept. no. 3, 1 Apr-30 Jun 65,
by Richard G. Baldwin. 25 Jul 65, 3p. Contract AF33 (657)-13904 ARPA ,Order-104 Proj. AFTAC-VT/5052

Unclassified report

See also AD-625 464.

Descriptors: (*Seismological stations, Data processing systems), Seismology, Instrumentation, Nuclear explosions, Detection, Arizona

**AD-625 556 Fld. 8/11, 18/3**
**CFSTI Prices: HC $5.00 MF $1.25**
*TEXAS INSTRUMENTS INC DALLAS*
**ARRAY RESEARCH.**
Semiannual technical rept. no. 3, 15 Nov 64-15 May 65,
by Robert Roden, John Hoffman, Aaron Booker, Frank Binder, and Sam Rodgers. 3 Jun 65, 153p. Contract AF33 (657)-12747 ARPA ,Order-104-60 Proj. AFTAC-VT/4053

Unclassified report

Descriptors: (*Nuclear explosions, Detection), (*Seismic waves, Noise), (*Seismographs, Configuration), Seismological stations, Data processing systems, Texas, Arizona, Instrumentation, Seismometers

Deep-well seismic data recorded at UBO in SeptemberOctober 1964 are used to estimate the capabilities of three 3-element vertical arrays and one hypothetical 6-element vertical array. The application of deconvolution and autocorrelation techniques to three ensembles of earthquake records from the multichannel processor at CPO is being studied. Statistics of discrepancies between observed and USC and GS reported origin times, magnitudes and depths of focus are examined. A description of the mathematical operations and computer programs required to perform probabilistic processing is given. Four multichannel filter systems for CPO were designed using the full array and three partial arrays. Information concerning the recording and preliminary processing and analysis of a 20-min ambient seismic noise sample from the ring array, the large cross array and a 3-component seismometer at Tonto Forest Seismological Observatory is given.

**AD-625 607 Fld. 8/11, 14/2**
**CFSTI Prices: HC $5.00 MF $1.00**
*TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV*
**MULTIPLE ARRAY PROCESSOR.**
Final rept. 1 Oct 64-31 Aug 65,
by James P. Edwards,III.. 29 Oct 65, 159p. Contract AF33 (657)-13904 ARPA ,Order-104 Proj. AF-VT/5052 ,8100

Unclassified report

Descriptors: (*Seismological stations, Data processing systems), Noise, Seismic waves, Instrumentation, Utah

The report describes the synthesis and evaluation of multichannel filters for the Uinta Basin Seismological Observatory. The filters were designed for use in two on-line multiple array processors (MAP). A 19-channel and a 10-channel multiple array processor were designed, fabricated and installed at the Uinta Basin Seismological Observatory. The 19-channel processor was equipped with 7 multichannel filters and 6 beam-steer outputs. These filters were designed for operation on var-

ious configurations of the subsurface 3-dimensional 16-element array. The 10-channel processor was equipped with 3 multichannel filters and 6 beam-steer outputs. All were designed for operation on the 10-element surface planar array. (Author)

**AD-625 199 See Fld. 17/10**

## 8/12. SNOW, ICE, AND PERMA FROST

**AD-624 974 See Fld. 7/4**

## 8/13. SOIL MECHANICS

**AD-624 892 Fld. 8/13, 13/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*RENSSELAER POLYTECHNIC INST TROY NY*
**DISCUSSION,**
by Robert L. Schiffman. 1965, 9p.
Unclassified report

Presented at the International Conference on Soil Mechanics and Foundation Engineering Division-2Shear Strength and Consolidation (6th).

Descriptors: (*Soil mechanics, Porous materials), Porosity, Water, Soils, Elasticity, Stresses, Foundations (Structures), Engineering geology, Theory

Theories on the consolidation of a soil system in a poro-elastic continuum.

**AD-625 443 Fld. 8/13, 13/2, 13/13**
**CFSTI Prices: HC $4.00 MF $1.00**
*BUREAU OF RECLAMATION DENVER COLO SOILS ENGINEERING BRANCH*
**LABORATORY STUDIES ON THE EFFECTS OF LABORATORY SIMULATED EARTHQUAKE LOADINGS ON COHESIVE SOIL STRENGTH, SAN LUIS DAM AND CANAL--SAN LUIS UNIT CENTRAL VALLEY PROJECT, CALIFORNIA,**
by Willard Ellis. 26 Oct 65, 136p. Rept. no. em-715
Unclassified report

Descriptors: (*Soil mechanics, Test methods), (*Inland waterways, Soil mechanics), (*Dams, Soil mechanics), (*Civil engineering, Soil mechanics), California, Reclamation, Engineering geology, Soils, Hydraulic models, Laboratories, Earthquakes, Loading (Mechanics), Simulation

The laboratory method of testing cohesive soils to determine the effects of pulsating stresses, simulating the effects of earthquakes, provided adequate data for designing hydraulic structures made from these materials. The tests were performed on undisturbed finegrained clay soil from the San Luis Dam foundation and on undisturbed and remolded fine-grained clayey and sandy clay soils from the first 3 reaches of the canal to determine soil strength characteristics under dynamically applied stresses. The normal triaxial shear apparatus was used with modifications to apply vertical or deviator stress (sigma sub 1 - sigma sub 3) at a rate of 2 pulses per second. Results of the dynamic tests on individual soils are compared to the normal soil strengths at equivalent strains. The maximum normal soil strength is assigned a value of 100%, and soil strengths under pulsating stress may be expressed as a percentage of this. The studies show that confining pressure does not appreciably affect the relationship between normal and dynamic soil strength. Thus, the ratio of dynamic to normal soil strength may be applied directly to safety factors derived from normal strength test data. Results show the dynamic soil strength to be generally up to 15% greater than the normal strength for overconsolidated plastic clays. However, dynamic soil strength is less than the normal by about 10% for low density, wet of optimum water content, sandy clays, specially at low strains. (Author)

**AD-625 113 See Fld. 13/13**

**AD-625 390 See Fld. 13/6**

**AD-625 391 See Fld. 19/4**

## 8/14. TERRESTRIAL MAGNETISM

**AD-625 457 Fld. 8/14, 20/9**
**CFSTI Prices: HC $3.00 MF $0.50**
*WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY*
**STUDIES OF THE DYNAMO ACTION OF THE LIQUID CORE OF THE EARTH.**
Final rept. Jan 63-Aug 65,
by A. F. Stevenson. 16 Aug 65, 56p. Contract AF19 (628)-2497 Proj. AF-7601 Task 7601 AFCRL 65-609
Unclassified report

Descriptors: (*Terrestrial magnetism, Magnetohydrodynamics), (*Magnetohdrodynamics, Geophysics), (*Geophysics, Magnetohydrodynamics), (*Telluric currents, Magnetohydrodynamics), Earth (Planet), Rotating, Underground, Fluid flow, Magnetic fields, Mathematical analysis

The differential equations for the steady motion of a rotating conducting fluid interacting with a magnetic field, and 'driven' by a volume distribution of thermal sources, have been set up. They contain two dimensionless parameters, one of which is proportional to the Joule heating and the other to the difference between the temperature gradient maintained by the thermal sources and the adiabatic temperature gradient. The problem is reduced to solving an infinite set of quadratic equations, and all necessary numerical calculations of the integrals involved have been carried out. The infinite set of equations can be approximated by finite sets, and properties of these sets have been investigated in detail. It has been shown that the two parameters of the problem must be related. Simple solutions of finite sets have been obtained, and a great deal of I.B.M. 7070 computer time has been devoted to attempts to generalize these solutions, but without success. The existence of a steady state dynamo has not been proved or disproved. The work reported should be of value to anyone undertaking similar calculations in the future. (Author)

**AD-625 036 See Fld. 4/1**

**AD-625 178 See Fld. 3/2**

**AD-625 250 See Fld. 4/1**

## 9/1. COMPONENTS

**AD-624 868 Fld. 9/1**
**CFSTI Prices: HC $4.00 MF $1.00**
*DELCO RADIO DIV GENERAL MOTORS CORP KOKOMO IND*
**STUDY OF GERMANIUM DEVICES FOR USE IN A THERMOPHOTOVOLTAIC CONVERTER.**
Quarterly rept. no. 1, 1 Jul-1 Oct 65,
by D. P. Crouch, and R. W. Bek. Jan 66, 130p.
Contract DA-28-043-AMC-01420 (E) Proj. DA-1C6-22001-A053 Task 1C6-22001-A053-01,1C6-22001-A053-10
ECOM 01420-1
Unclassified report

Descriptors: (*Photoelectric cells (Semiconductor), Germanium), (*Germanium Photoelectric cells (Semiconductor)), Energy conversion, Epitaxial growth, Surface properties, Doping, Optical coatings, Voltage, Electrical properties

Experimental cells containing variqus structural design variations were fabricated and tested. The effects of grid configuration variations and grid material variations on device performance were investigated. An examination of the effect of acceptor concentration variations in the P+ layer of the N on P+ device was made. A study of the optical generation resistivity compromise between decreased resistivity for increased open circuit voltages and curve factors and increased resistivity for increased short circuit currents was initiated. Optical and electrical evaluation was performed on the first group of vendor processed anti-reflection coated devices. The initial experiments involving the determination of the effects of various front surface chemical treatments on the performance and stability of the absorptive device were made. Passivation studies were started to determine the effect of thin front surface diffused layers on the performance and stability of the N on P+ absorptive device. A system for epitaxial deposition of germanium utilizing the iodine disproportionation in a close-spaced transport configuration has been constructed. (Author)

**AD-625 007 Fld. 9/1**
**CFSTI Prices: HC $6.00 MF $1.50**
*OFFICE OF NAVAL RESEARCH WASHINGTON D C*
**CONFERENCE ON THE NAVY MICROELECTRONICS PROGRAM (3RD), AT THE U.S. NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIFORNIA, APRIL 5, 6, 7, 1965.**
1965, 299p. Rept. no. onr-22-Vol-1
Unclassified report

Descriptors: (*Microminiaturization (Electronics), Symposia), (*Naval research, Microminiaturization (Electronics)), Naval equipment, Metal films, Films, Capacitors, Radiation damage, Transmitter-receivers, Telemeter systems, Digital systems, Integrated circuits, Computers, Transistors, Semiconductor devices, Amplifiers, Loran equipment

The purpose of the conference was the exchange of technical information on the state-of-the-art and progress in microelectronics as applied to Navy systems.

**AD-625 018 Fld. 9/1, 20/14**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**LATERAL-FEED DISPLACEMENT IN A PARABOLOID.**
Revised ed.,
by John Ruze. 11 Mar 65, 8p. Rept. no. JA-2325A
Contract AF19 (628)-5167 ESD TDR-65-552
Unclassified report

Revision of manuscript submitted 2 Apr 64.

*Availability: Published in IEEE Transactions on Antennas and Propagation vap13 n5 p660-5 Sep 1965. Copies to DDC users only.*

Descriptors: (*Antennas feeds, Parabolic antennas), (*Parabolic antennas, Antenna feeds), Antenna radiation patterns, Diffraction, Optical systems, Reflectors

The beam shift and degradation of a paraboloidal reflector with an offset feed is analyzed by the scalar plane wave theory. Higher order coma terms are included with the feed at its optimum axial position. The beam characteristics for a tapered circularly symmetric illumination are presented. The range of validity of the approximate analysis is indicated. (Author)

**AD-625 051 Fld. 9/1, 18/8, 19/1**
**CFSTI Prices: HC $4.00 MF $1.00**
*PITMAN-DUNN RESEARCH LABS FRANKFORD ARSENAL PHILADELPHIA PA*
**FERROELECTRICS: THEIR ELECTRICAL BEHAVIOR DURING, AND SUBSEQUENT TO, IONIZING RADIATIONS.**
Final technical rept.,

by I. Lefkowitz, K. Kramer, and P. Kroeger. Nov 65, 146p. Rept. no. R-1779
Proj. DA-IN22601A085

Unclassified report

Descriptors: (*Ferroelectric materials, Radiation damage), (*Radiation damage, Ferroelectric materials), Electrical properties, Capacitors, Polarization, Piezoelectric crystals, Dielectrics, Fuzes (Ordnance), Reliability (Electronics), Circuits

A study was made on certain ferroelectric materials which are among those used extensively in military applications, both in a polarized condition in such items as impact fuzes and in an unpolarized condition as capacitors. The transient voltages across a load produced by charge generated on the surface of various types of ferroelectric specimens during irradiation have been measured. These outputs were found to vary widely in amplitude and polarity even from specimens ostensibly alike (i. e., from the same lot of a given manufacturer), and even from a single specimen pulsed repeatedly with gamma and neutron radiation. Pulses were found to vary from background levels to a high of 300 volts on a large specimen with a load of 10 to the 7th power ohms and radiation of 5.4 x 10 to the 14th power fast (Pu) neutrons and associated gammas. The maximum voltage possible is unknown, as are the factors causing the variation. Both polarized and unpolarized specimens showed outputs well above background transients. Some specimens were identical to those used in impact fuze applications and were in simulated housings which reproduce the mechanical environment of the device. Some fuze circuits in present use are discussed with reference to their use of ferroelectric materials and a calculation of the energy transferred by a voltage pulse to a load is presented. (Author)

**AD-625 157 Fld. 9/1, 18/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EFFECT OF GAMMA-RAYS CO60 ON F. E. U. PARAMETERS,**
by A. N. Pertsev, A. N. Pisarevskii, and L. D. Soshin. 9 Dec 65, 13p. Rept. no. ftd-TT-65-1139
TT 66-60018

Unclassified report

Unedited rough draft trans. of Pribory i Tekhnika Eksperimenta (USSR) v10 n2 p146-9 1965.

Descriptors: (*Photomultipliers, Radiation damage), (*Radiation damage, Gamma rays), Cobalt, Performance (Engineering), Photocathodes, Sensitivity, USSR

The effect on subsequent operation of photomultipliers irradiated with Co60 gamma rays is discussed. It is shown that reverse sensitivity changes take place in the photocathode and in the amplification coefficient of the photomultiplier. (Author)

**AD-625 190 Fld. 9/1, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*ITT ELECTRON TUBE DIV ROANOKE VA*
**PRODUCTION ENGINEERING MEASURE FOR TYPE FW-202 BARRIER GRID STORAGE TUBE.**
Rept. no. 14, 1 Oct-31 Dec 64,
by J. D. Hagan. 31 Dec 64, 21p. Rept. no. 3235A
Contract DA-36-039-sc-85967

Unclassified report

See also AD-622 877.

Descriptors: (*Storage tubes, Manufacturing methods), Production, Tests, Performance (Engineering), Electron beams, Electron guns, Life expectancy, Electron tube parts

During the report period, thirty-four tubes were placed in stock after complete specification testing. Major causes of reject tubes are still defective targets and low beam currents. The new style gun construction has greatly reduced the low beam current problem. (Author)

**AD-625 200 Fld. 9/1, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*
**SET OF CUT SETS AND OPTIMUM FLOW,**
by Wataru Mayeda, and Mac E. Van Valkenburg. Nov 65, 20p. Rept. no. r-270
Contract DA-28-043-AMC-00073Grant ,AF-AFOSR-931-65 Proj. DA 20014501B31F

Unclassified report

Descriptors: (*Set theory, Electrical networks), (*Electrical networks, Communication systems), Topology, Networks, Graphics, Optimization, Telephone communication systems

An important unsolved problem in the theory of communication nets is the enumeration of the properties of a set of edge flows necessary to give a required terminal flow from one vertex to another. For example, there is no simple method for obtaining a set of edge flows to give maximum terminal flow. The relationship of these flows and the conditions necessary to obtain maximum flow are important practical problems in systems in which edge flow is limited; in the telephone system for example. Clearly an improvement would result if it were possible to reduce some edge flows and still maintain the same terminal flow. The method presented stems from the work of Ford and Fulkerson which relates maximum terminal flow to the cut set separating the terminals. A new set of cut sets called a 'set of M-cut sets' is introduced from which it is possible to improve edge flows while maintaining maximum terminal flow.

**AD-625 201 Fld. 9/1, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*
**ELEMENTARY COMPLETE TREE TRANSFORMATION,**
by Wataru Mayeda. Dec 65, 24p. Rept. no. r-272
Contract DA-28-043-AMC-00073 Grant ,AF-AFOSR-931-65 Proj. DA-20014501B31F

Unclassified report

Descriptors: (*Networks, Topology), (*Topology, Networks), (*Transformations (Mathematics), Topology), Communication systems, Electrical networks, Set theory, Digital computers, Graphics

It is known that a passive electrical network without mutual couplings can be analyzed by knowning all possible trees of a linear graph corresponding to the network. Since there exists a reasonably simple method of generating all possible trees of a linear graph without duplications, analysis of such a network by a computer becomes simple. When a pair of linear graphs is used, an active network can be analyzed by knowing all possible complete trees each of which is a tree of both linear graphs. At present there is no simple method of generating all possible complete trees without duplications. Hence, in order to obtain all possible complete trees by a computer, one of the best available methods at present is to generate all possible trees of each linear graph to obtain two collections of trees, then intersecting the two collections. It is not difficult to design an active network such that there are more than a thousand of trees in each of a pair of linear graphs corresponding to the net, but there are less than one hundred complete trees. Hence to obtain a simple method of generating all possible complete trees is undoubtedly important for analysis of active networks by a computer.

**AD-625 202 Fld. 9/1, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*LEWIS (E B) CO INC EAST HARTFORD CONN*
**PRODUCTION ENGINEERING MEASURE CRYSTAL UNIT CR- (XM-46A)/U.**
Quarterly rept. no. 9, 1 Feb-1 May 65,
by Robert P. McComb. 1 May 65, 30p. Contract DA-36-039-sc-86737

Unclassified report

Descriptors: (*Crystal filters, Manufacturing methods), Very high frequency, Resistance (Electrical), Performance (Engineering), Quartz, Wiring diagrams, Tests

The testing of Preproduction Samples of CR-(XM-46A)/U, AT cut crystals for filter application operating on the third overtone at frequencies of 30 and 45 MC/s is discussed and test procedures given. (Author)

**AD-625 277 Fld. 9/1, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**A CHEMICAL REACTION PRODUCES A MICROCIRCUIT,**
by V. Syrkin. 15 Dec 65, 14p. Rept. no. ftd-TT-65-1165
TT 66-60061

Unclassified report

Unedited rough draft trans. of Nauka i Zhizn (USSR) n10 p28-31 1964.

Descriptors: (*Metalorganic compounds, Films), (*Microminiaturization (Electronics), Metalorganic compounds), Circuits, Iron compounds, Ferromagnetic materials, Powders, Dielectrics, USSR

The report discusses the microminiaturization of circuits using films obtained from carbonyls of metals.

**AD-625 287 Fld. 9/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**BALANCED MIXER,**
by V. A. Libin, and B. P. Prokhorenkov. 15 Nov 65, 5p. Rept. no. ftd-TT-65-996
TT 66-60065

Unclassified report

Unedited rough draft trans. of Russian patent 165 799, appl. no. 756200/26-9, 18 Dec 61, 2p.

Descriptors: (*Mixers (Electronics), Microwave equipment), Waveguides, Diodes, Patents, USSR

A balanced mixer designed on two rectangular waveguides which has the end part of the heterodyne waveguide connected to the wide wall of the signal waveguide. The plane E of the signal waveguide is parallel to the plane H of the heterodyne waveguide and the connection of the heterodyne waveguide with the diodes is accomplished with a symmetrical loop of magnetic connection.

**AD-625 317 Fld. 9/1, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV*
**PRODUCTION ENGINEERING MEASURE FOR SILICON OVERLAY TRANSISTORS.**
Quarterly progress rept. no. 2, 1 Apr-30 Jun 65,
by Michael Cassidy, and Paul Greer. 30 Jun 65, 31p. Contract DA-36-039-AMC-06156 (E)
Proj. DA-74001

Unclassified report

Descriptors: (*Transistors, Manufacturing methods), (*Silicon, Transistors), Diffusion, Gold, Chemical milling, Precision finishing, Processing, Encapsulation, Bonding, Glass, Wire, Epitaxial growth, Reliability (Electronics), Quality control

Progress during the report period consisted of the following: (1) Fabrication of devices using the

boron tribromide (BBr3) base diffusion method. Wafers are also in process using a combination of the BBr3 base diffusion and the emitter-gold emitter diffusion. (2) transition to 2-inch masks to give better definition and detail. Mask measurement by precise methods to insure mask accuracy and repeatability. (3) Evaluation of effects of variations in emitter stripe width. (4) Fabrication of wafers using the chemical etch process. (5) Construction of wafer storager cabinet to determine effects of prolonged wafer storage between various process steps. (6) Continued investigation of ultrasonic wire bonding and analysis of the results obtained by ultrasonic bonding to raw kovar top posts. (7) Development of a process evaluation test plan and an environmental step stress test plan. Completion of initial electrical parameter readouts. Evaluation of samples fabricated using the BBr3 base diffusion method. (Author)

**AD-625 325 Fld. 9/1, 17/2.1, 13/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES*
**TRANSISTOR, VHF, SILICON, POWER, LINEAR, 30-MC, 100 WATTS PEP.**
Quarterly progress rept. no. 1, 1 Jun-31 Aug 65,
by R. Rosenzweig, and D. R. Carley. 31 Aug 65, 59p. Contract DA-28-043-AMC-10387 (E)
Proj. DA-1P6-22001-A-056
Unclassified report

Descriptors: (*Transistors, Manufacturing methods), (*Single sideband communication systems, Transistors), Transistor amplifiers, Theory, Design, Diodes, Thermal stability, Distortion, Bonding, Packaging, Ceramic materials, Silicon, Very high frequency

The report contains information concerning the relationship of device design considerations to device operation in single sideband circuits. The requirement for low intermodulation distortion necessitates Class AB biasing, causing the device to operate in a mode where second breakdown and thermal runaway are prevalent. The reduction of second breakdown by the addition of ballast resistors and the use of a temperature compensating diode for bias point control are used to ensure reliable, safe operation. Photomasks have been designed for the 100-Watt, 30-megacycle device. The description of the pattern as well as the actual dimensions are given. (Author)

**AD-625 379 Fld. 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH*
**MICROELECTRONIC AMPLIFIERS HAVING MINIMUM SENSITIVITY TO ARBITRARY PARAMETER CHANGES,**
by John J. Golembeski, James H. Mulligan Jr., Mohammed S. Ghausi, and Sidney S. Shamis. Oct 65, 28p. Rept. no. scientific-21 ,TR-400-119
Contract AF19 (628)-379 Proj. AF-5628 Task 562806
AFCRL 65-802
Unclassified report

Descriptors: (*Microminiaturization (Electronics), Amplifiers), (*Amplifiers, Microminiaturization (Electronics)), Transistors, Integrated circuits, Sensitivity, Reliability (Electronics)

The ease and low cost of fabricating large numbers of transistors in microelectronic configurations make feasible the use of redundant active devices to achieve improved reliability and decreased sensitivity to parameter changes. This paper considers an amplifier configuration which has particular advantages for microcircuit realization. The arrangement described is capable of yielding a fractional gain change which is equal to the product of the fractional deviations in the gains of each of the redundant signal channels. The nominal input-output transmission is maintained, with negligible changes in gain and bandwidth, even with complete failure of one or more (but not all) of the signal channels; this is achieved at the expense of an increase in sensitivity. The sensitivity to large parameter changes can be minimized over an appreciable portion of the amplifier passband by use of the systematic design procedure which is presented. Experimental verification of theoretical predictions and the design procedure is included. (Author)

**AD-625 389 Fld. 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**FURTHER STUDIES ON HYDROGEN AND DEUTERIUM CLEANUP.**
Technical rept.,
by Sol Schneider, and Norman L. Yeamans. Dec 65, 27p. Rept. no. ecom-2639
Proj. DA-1P6-22001-A-055 Task 1P6-22001-A-055-02-11
Unclassified report

Descriptors: (*Electron tubes, Deuterium), (*Sorption, Deuterium), Hydrogen, Pressure, Diffusion, Thyratrons, Clipper circuits, Rectifiers, Diodes

Interest has developed in the use of deuterium as a replacement for hydrogen in thyratrons, clippers, and rectifiers, due to the apparent ability of deuterium to hold off greater voltages than hydrogen under the same conditions. Deuterium also provides a lower arc drop in the gas. At the same time it has the disadvantage of a longer recovery time after a pulse, because of its increased mass. In view of the increasing use of deuterium as a fill gas, a limited experiment to study the transient cleanup phenomena in deuterium was conducted. It was determined that hydrogen and deuterium transient cleanup obey the same fundamental relationship with respect to discharge parameters. In both cases the percentage cleanup under dynamic operating conditions is directly proportional to the square root of the power dissipated in the tube. There were no apparent differences in the solubility factor of the equation. The prime difference in the behavior of both gases was determined to be the difference in diffusion rates. The experimental techniques, the fundamental relationships, the theoretical considerations, the influence of the physical state of the nickel, and the long-term effects are discussed. (Author)

**AD-625 425 Fld. 9/1, 13/8**
*INTERNATIONAL RECTIFIER CORP LOS ANGELES CALIF*
**PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICON RECTIFIER STACKS.**
Final rept. 24 Jun 61-24 Oct 65,
by A. Conn. 24 Oct 65, 648p. Contract DA-36-039-SC-85977
Unclassified report

See also AD-624 446.

*Availability: Reference only at DDC Hq after original copies exhausted. Not for sale.*

Descriptors: (*Rectifiers, Silicon), (*Diodes (Semiconductor), Rectifiers), Modules (Electronics), Performance (Engineering), Voltage, Specifications, Tests, Production, Processing, Design, Wiring diagrams, Mechanical drawings

The report is the culmination of four years of intensive effort into the construction of a high voltage rectifier assembly of high reliability. The report is divided into three sections, the first section containing the results of the engineering samples, preproduction, and production units furnished to the Signal Corps. Each set of samples is treated separately having its own photographs and figures. Complete test results, detailed descriptions of problems encountered, photographs, and drawings are included. The final design resulted in a device which completely fulfills the intent of the original specification. (Author)

**AD-625 433 Fld. 9/1**
**CFSTI Prices: HC $4.00 MF $0.75**
*FAIRCHILD SEMICONDUCTOR RESEARCH AND DEVELOPMENT LABS PALO ALTO CALIF*
**UHF SMALL SIGNAL TRANSISTOR.**
Rept. no. 5 (Final) 1 Apr 64-15 Aug 65,
by D. K. Myers, and M. Purnaiya. 15 Aug 65, 128p. Contract DA-28-043-AMC-00040 (E)
Proj. DA-1P6-22001-A-056 Task 1P6-22001-A-056-01
Unclassified report

See also AD-621 084.

Descriptors: (*Transistors, Ultrahigh frequency), (*Transistor amplifiers, L band), Gain, Stability, Noise (Radio), Reliability (Electronics), Production, Wiring diagrams, Performance (Engineering)

The shipment of transistors consists of 30 transistors in the stripline package, and 70 transistors in a modified TO-18 package and 10 transistors in a TO-51 package. A detailed analysis of all experimental data is given. All transistors meet or exceed the primary requirements on power gain, stability, and noise figure. This includes a gain figure greater than or equal to 37.0 db; unilateral gain greater than or equal 12 db; stability factor between 0.7 - 1.5; and noise figure less than 6 db at 500 Mc at the operating level of 12 mW. Reliability data on units mounted in the stripline, TO-18 and TO-51 package are furnished. (Author)

**AD-625 438 Fld. 9/1**
**CFSTI Prices: HC $4.00 MF $0.75**
*MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB*
**RESEARCH ON CROSSED-FIELD ELECTRON DEVICES.**
Interim scientific rept. no. 6, 15 Mar-15 Sep 65,
by T. A. DeMassa, D. D. Khandelwal, S. G. Lele, N. A. Masnari, and K. F. Morman. Oct 65, 107p. Rept. no. 05361-12-S
Contract DA-36-039-AMC-00027 (E) Proj. DA-3A99-13-001-01 ,05361
Unclassified report

Descriptors: (*Crossed field devices, Performance (Engineering)), (*Microwave amplifiers, Crossed field devices), (*Electron guns, Crossed field devices), (*Noise (Radio), Crossed field devices), Beams (Electromagnetic), Radiofrequency, Electron beams, S band, Secondary emission, Noise analyzers, Mathematical analysis

Pulsed operation of the S-band amplifier using an abbreviated Kino gun resulted in a maximum gain of approximately 20 db. Attempts at cw operation resulted in large interception of the beam by the slow-wave circuit with the subsequent melting of several fingers of the line. Replacement of the circuit by a three-segment planar anode resulted in good d-c transmission although spurious oscillations were present over a wide frequency range. Computer calculations of the noise-parameter variations as a function of frequency and position along the beam were carried out for a crossed-field drift region. Experimental investigations with various gun geometries resulted in intrinsic oscillations which could be suppressed by the application of a signal near the cathode. The oscillations appeared to originate in the near-cathode region. A modified aperture system was designed for the investigation of crossed-field electron beams in the beam analyzer. The beam analyzer and associated components are being adapted to allow the investigation of space-charge flows when they are subjected to interaction with an r-f wave.

**AD-625 452 Fld. 9/1, 14/2**
**CFSTI Prices: HC $3.00 MF $0.50**
*POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH*

**MEASUREMENT TECHNIQUES FOR OVER-SIZED WAVEGUIDE.**
Research rept.,
by B. L. Gupta. 18 Nov 65, 54p. Rept. no. pib-mri-1299-65
Contract AF49(638)-1402
Unclassified report

Descriptors: (*Waveguides, Measuring device (Electrical + electronic)), (*Standing wave ratios, Waveguides), Dielectrics, Microwave frequency, Electromagnetic waves, Propagation

The first phase of this work is concerned with the identification as well as estimating the power coupling of spurious modes in the presence of TE10, the main mode in the overmoded waveguide. The second phase would consider the measurement of known or approximately known discontinuities such as dielectric slabs and capacitive irises or steps. Precision experimental procedure carried out enables the measurement of spurious modes coupled more than 25 db below the main mode. The dielectric constant evaluated from the experimental results was surprisingly close to the previously measured and specified value. The device under study is a 6 inch square overmoded waveguide fed by a sequence of long rectangular tapers from standard S, C and X band waveguides. (Author)

**AD-625 531 Fld. 9/1, 20/12, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH NJ*
**IMPROVED THIN-FILM CAPACITOR CHARACTERISTICS BY REANODIZATION.**
Technical rept.,
by Aubrey Raffalovich. Dec 65, 34p. Rept. no. ecom-2635
Task DA-1C0-24401-A-348-04
Unclassified report

Descriptors: (*Capacitors, Films), (*Films, Tantalum), Tantalum capacitors, Sputtering, Electrical properties, Anodic coatings, Processing

A capacitor with improved electrical characteristics was fabricated by the reanodization of previously anodized tantalum films. The technique is simple. Comparative data was obtained between anodized and reanodized tantalum films. The tantalum was deposited by sputtering approximately 1000 A of the metal onto glass substrates. The counter electrode was gold. The average voltage breakdown for the anodized samples was 60% of the formation voltage with 50% of all samples withstanding 70% V sub F. With the reanodized samples, the average breakdown was 140% V sub F; 50% of all samples withstanding 100% V sub F and 11% withstanding 500% V sub F. As a corollary, the current leakage characteristics of the reanodized samples were also improved. The reanodized samples showed good reverse polarity characteristics. There was a 10% improvement in capacitance and 15% improvement in the temperature coefficient of capacitance. There was no difference in dissipation factor, it being 1.3% for both processes. (Author)

**AD-625 533 Fld. 9/1, 18/8, 20/12**
**CFSTI Prices: HC $2.00 MF $0.50**
*HUGHES AIRCRAFT CO NEWPORT BEACH CALIF MICROELECTRONICS DIV*
**EFFECT OF TRANSISTOR DESIGN PARAMETERS ON RADIATION RESPONSE (SURFACE EFFECTS).**
Quarterly rept. no. 3, 15 Jun-15 Sep 65,
by Brian D. Gallagher, and Vincent R. Honnold. Dec 65, 29p. Contract DA-28-043-AMC-00418 (E) Proj. DA-5900.21.830.23.00 ECOM 00418(E)-3
Unclassified report

See also AD-624 509.

Descriptors: (*Transistors, Radiation damage), (*Surface properties, Transistors), Semiconductor devices, Design, Transients, Silicon, Carriers (Semiconductors), Photoconductivity

Concluding experimental irradiation data were taken on four groups of Silicon bars, each containing five samples ranging in thickness between .003 in. and .012 in. The four groups duplicated surface conditions of mechanical polish, etch, sandblast, and oxide processed into the transistor lots tested in the first two quarters. After irradiation, the effective lifetime of each bar was determined. Surface recombination velocity for each surface treatment was then calculated by plotting 1/effective minority carrier lifetime as a function of 1/c-sq. where c is the bar thickness. The development of the equations for induced photocurrent for the planar configuration was expanded. (Author)

**AD-625 583 Fld. 9/1**
*CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB*
**ANODE STRUCTURES FOR COLD-CATHODE HIGHPOWER MAGNETRONS.**
by Yoshitaka Ikeda, and Charles Susskind. 31 Jul 64, 9p. Contract AF19(628)-324 Grant AF-AFOSR-139-63 Proj. AF-4751 AFOSR 65-2194
Unclassified report

*Availability: Published in The Radio and Electronic Engineer v29 n2 p93-9 Feb 1965. Copies to DDC users only.*

Descriptors: (*Magnetrons, Anodes (Electron tubes)), (*Anodes (Electron tubes), Magnetrons), Cold cathode tubes, Electron tube parts, Electron beams, Radiofrequency power, Resonant frequency, Electrical impedance, Circuits

The characteristics of anode structures suitable for cold-cathode high-power magnetrons have been investigated analytically and experimentally, with special emphasis on increasing the interaction and maximizing the area of coherent interaction with the electron beam at a given frequency. The structures analysed were designed for large mode separation, high interaction impedance, and easy coupling to the output circuit. They may be applicable to travelling-wave amplifiers; some circuit characteristics of the structures are therefore also included. (Author)

**AD-625 584 Fld. 9/1, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*MALLORY (P R) AND CO INC INDIANAPOLIS IND*
**PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITY OF SOLID ELECTROLYTE TANTALUM CAPACITORS.**
Quarterly rept. no. 9, 30 Jun-29 Sep 65,
by A. W. H. Smith. 29 Sep 65, 11p. Contract DA-36-039-AMC-03623 (E)
Unclassified report

Descriptors: (*Tantalum capacitors, Manufacturing methods), Electrolyte capacitors, Reliability (Electronics), Performance (Engineering), Production, Life expectancy, Electrical properties

The balance of the production run capacitors were manufactured and Group A tested. One lot consisting of 1692 capacitors, reached the 2000 hour life test point in Group C. One failure was recorded. All equipment is now available. Group B and most of the Group D tests will be completed next quarter. The balance of the Group C test units are expected to reach the 1000 hour test point by the end of the tenth quarter. (Author)

**AD-624 949 See Fld. 9/5**

**AD-624 989 See Fld. 7/2**

**AD-625 020 See Fld. 14/2**

**AD-625 039 See Fld. 18/8**

**AD-625 341 See Fld. 18/8**

**AD-625 479 See Fld. 13/8**

## 9/2. COMPUTERS

**AD-624 938 Fld. 9/2, 5/7**
**CFSTI Prices: HC $2.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**DETERMINISTIC CONTEXT FREE LANGUAGES,**
by Seymour Ginsburg, and Sheila Greibach. 7 May 65, 47p. Rept. no. tm-738/014/00
Contract AF19(628)-3418 Proj. AF-5632 Task 563205
AFCRL 65-415
Unclassified report

Prepared in cooperation with Harvard Univ., Cambridge, Mass.

Descriptors: (*Context free grammars, Analysis), (*Programming languages, Theory), Automata, Mathematical logic, Algebra, Computer storage devices

A number of results about deterministic languages (languages accepted by pushdown automata with no choice of moves) are established. In particular, (1) each deterministic language is unambiguous. (2) the complement of each deterministic language is a deterministic language. (3) numerous operations which preserve deterministic languages (for example, intersection with a regular set) are obtained. (4) several problems are shown to be recursively unsolvable. (Author)

**AD-624 939 Fld. 9/2, 5/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**FAILURE OF A CONJECTURE ABOUT CONTEXT FREE LANGUAGES,**
by Joseph Ullian. 9 Sep 65, 12p. Rept. no. tm-738/019/00 ,Scientific-4
Contract AF19(628)-5166 Proj. AF-5632 Task 563205
AFCRL 65-806
Unclassified report

Prepared in cooperation with California Univ., Santa Barbara.

Descriptors: (*English language, Context free grammars), (*Context free grammars, English language), Programming languages, Language, Analysis, Set theory

**AD-624 940 Fld. 9/2, 5/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**ALGORITHMIC LANGUAGES PROJECT.**
Final rept. 12 Oct 64-30 Jun 65,
by Seymour Ginsburg. 7 Sep 65, 11p. Rept. no. tm-738/017/00
Contract AF19(628)3418 Proj. AF-5632 Task 563205
AFCRL 65-797
Unclassified report

See also AD-613 290, AD-614 073, AD-618 937, AD-624 938.

Descriptors: (*Programming languages, Theory), Mathematical logic, Set theory, Algebra, Language, Automata, Transducers, Mathematical models, Linear systems, Computer storage devices, Context free grammars, Algorithms

The purpose of this investigation was to accomplish the following: (1) Conduct research designed to develop a theory for algorithmic (programming) languages. (2) Develop suitable mathematical

models of currently used mathematical languages such as ALGOL, COBOL, and JOVIAL. (3) Use the mathematical models to answer questions of interest about these languages.

**AD-624 943 Fld. 9/2, 12/2**
**CFSTI Prices: HC $4.00 MF $0.75**
*MASSACHUSETTS INST OF TECH CAMBRIDGE*
**QUEUEING MODELS FOR FILE MEMORY OPERATION.**
Master's thesis,
by Peter James Denning. Oct 65, 110p. Rept. no. mac-TR-21
Contract Nonr-4102 (01) Proj. NR-048-189
Unclassified report

Report on proj. MAC.

Descriptors: (*Queueing theory, Computers), (*Data storage systems, Operation), Model theory, Operations research, Real time, Multiple operation

A model for the auxiliary memory function of a segmented, multi-processor, time-shared computer system is set up. A drum system in particular is discussed, although no loss of generality is implied by limiting the discussion to drums. Particular attention is given to the queue of requests waiting for drum use. It is shown that a shortest access time first queue discipline is the most efficient, with the access time being defined as the time required for the drum to be positioned, and is measured from the finish of service of the last request to the beginning of the data transfer for the shortest access time queue is made, giving the minimum access time probability distribution, equations for the number in queue, and equations for the wait in the queue. Simulations were used to verify these equations; the results are discussed. Finally, a general Markov Model for Queues is discussed in an Appendix. (Author)

**AD-625 003 Fld. 9/2, 5/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**THEORY, PRACTICE, AND TREND IN BUSINESS PROGRAMMING.**
Professional paper,
by Christopher J. Shaw. 1 Jul 65, 23p. Rept. no. sp-2030/001/02
Unclassified report

Descriptors: (*Programming languages, Commerce), (*Programming (Computers), Commerce), Theory, State-of-the-art reviews, Data processing languages

Surveys some work done in the last few years in the United States, both practical and theoretical in nature, likely to have an impact on programming practices for commercial and administrative problems. Topics include: nonprocedural languages, which emphasize problem statement rather than problem-solving procedures: generalized file processing systems, which enable program to be described in terms of files and reports and small sets of relatively powerful filekeeping operations; user-oriented, on-line systems that allow the nonprogrammer, sitting at a local or remote terminal, to retrieve and process data. (Author)

**AD-625 021 Fld. 9/2**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**THE SCALING OF DIGITAL DIFFERENTIAL ANALYZERS.**
Revised ed.,
by Harold K. Knudsen. 7 Dec 64, 9p. Rept. no. ja-2411
Contract AF19 (628)-5167 ESD TDR-65-546
Unclassified report

Revision of manuscript submitted 3 Sep 64.

*Availability: Published in IEEE Transactions on Electronic Computers vEC14 N4 P583-90 Aug 1965. Copies to DDC users only.*

Descriptors: (*Digital differential analyzers, Programming (Computers)), Linear programming, Optimization, Integrators, Servomechanisms, Differential equations, Bessel functions

A method for computing the scales needed for programming a digital differential analyzer (DDA) is developed. DDA program (interconnection) maps containing integrators and servos are considered. The scales must satisfy 'equilibrium,' 'topological,' and 'boundary' constraints. These constraints are shown to be equivalent to a set of linear inequalities. Linear programming techniques are used to find both feasible and 'optimal' scales. The use of linear programming eliminates the need for the usual trial-and-error scaling techniques and makes the scheme amenable to programming on a general-purpose digital computer. (Author)

**AD-625 046 Fld. 9/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*INFORMATION SYSTEMS LAB UNIV OF MICHIGAN ANN ARBOR*
**MONOTONE CONGRUENCE ALGORITHMS,**
by Richard F. Arnold, and Donald L. Richards. Apr 65, 27p. Rept. no. isl-65-2 ,06920-2-T
Contract AF30 (602)-3546 Grant ,AF-AFOSR-367-64 Proj. AF-9769 Task 976903
AFOSR 65-1736
Unclassified report

Descriptors: (*Algorithms, Programming (Computers)), (*Programming (Computers), Optimization), Automata, Set theory, Statistical processes

Given an associative system in which each element is assigned a cost and in which an equivalence relation obtains between elements, it is often of interest to ask the question: what is the least costly word equivalent to a given word. The case in which the equivalence relation is a two-sided congruence relation is studied here, one example being the problem of optimizing a type of computer program. Such optimizing processes may be formalized as Markov normal algorithms. A general result concerning order relations on finite alphabets is established first. Then, the properties of a class of Markov normal algorithms are investigated. It is shown that each such algorithm must always terminate, and that every class of mutually equivalent algorithms contains a unique minimal algorithm which can be obtained by applying any algorithm of the class to itself. (Author)

**AD-625 156 Fld. 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**CONCERNING ONE METHOD OF SEEKING DATA AND ITS APPLICATION IN THE REALIZATION, BY ELECTRONIC COMPUTER, OF THE ALGORITHM OF CRITICAL PATH DETERMINATION,**
by I. E. Mayzlin. 3 Dec 65, 9p. Rept. no. ftd-TT-65-1108
TT 66-60017
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady, v159 n4 p761-3 1964.

Descriptors: (*Programming (Computers), Algorithms), (*Algorithms, Programming (Computers)), Pseudorandom systems, Sequences, Optimization, USSR

**AD-625 181 Fld. 9/2, 5/8**
**CFSTI Prices: HC $3.00 MF $0.50**
*ADAMS (CHARLES W) ASSOCIATES INC CAMBRIDGE MASS*
**RESEARCH ON ADVANCED DYNAMIC ATTRIBUTE EXTRACTION TECHNIQUES.**
Final rept. Apr 62-May 65,
by John T. Gilmore,Jr., Frank S. Greatorex,Jr., and Edward N. Chase. 31 Jul 65, 54p. Contract AF19 (628)-453 Proj. AF-5632 Task 563201
AFCRL 65-736
Unclassified report

Descriptors: (*Display systems, Colors), (*Man-machine systems, Special purpose computers), Graphics, Computer storage devices, Cardiography, Analog-to-digital converters, Earth models, Programming (Computers), Real time

Two main areas of effort are described. The first is the development of a color display system which allows for the definition and modification of data stored in a list structure. The second area is the development of a man-graphic communication system which utilizes a buffered display scope, light pen and push-bottom panel to provide the console user with the basic ability to draw charts, diagrams, curves, etc., on the face of the display scope. The drawings may contain graphic and alphanumeric information, which is reduced to a condensed digital format called an entity table. The table can be operated on by special-purpose software operators either during the drawing action or after the drawing is completed. (Author)

**AD-625 235 Fld. 9/2, 12/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*ILLINOIS UNIV URBANA DEPT OF COMPUTER SCIENCE*
**ON THE STRUCTURE AND AUTOMORPHISMS OF FINITE AUTOMATA.**
Doctoral thesis,
by Zamir Bavel. 1 Oct 65, 93p. Rept. no. 192
Unclassified report

Descriptors: (*Automata, Mapping (Transformations)), (*Mapping (Transformations), Groups (Mathematics)), Computers, Set theory, Algebra

A minimal automaton is defined and its advantages illustrated. The notions of a primary of an automaton and of the generators of the primary are formulated. The source of a subset of states is defined. Homomorphisms, endomorphisms, isomorphisms, and automorphisms on automata are discussed. The cycle is used to characterize and count all automorphisms of a minimal automaton. The nature, behavior, and number of the members of P (A), the set of automorphisms leaving all primaries invariant, are studied via extensions of automorphisms of one primary to another.

**AD-625 240 Fld. 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF COLLECTING INFORMATION IN A LONG TERM MEMORY DEVICE,**
by V. V. Antonov, N. I. Markin, and N. V. Katkova. 21 Oct 65, 6p. Rept. no. ftd-TT-65-634
TT 66-60046
Unclassified report

Unedited rough draft trans. of Patent (USSR) 161 577 (Appl. no 812336/26-24 Jan 3 63 p2.

Descriptors: (*Data storage systems, Magnetic cores), (*Magnetic core storage, Computer logic), Information retrieval, Computer storage devices, USSR

The proposed device is distinguished from the known ones by the fact that on a template there are fastened casings in accordance with the placings of the rods of the cores on the table of the memory device. Windings are placed on the casings in accordance with the kind of codes of the information to be collected, and then the casings with the windings are taken off from the template and placed on the correspondingly arranged rods of the cores, after which the magnetic circuits are closed by their collection on the table.

**AD-625 288 Fld. 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF PIERCING THE SELECTING MATRIX OF A MEMORY,**
by A. K. Kultygin. 15 Nov 65, 4p. Rept. no. ftd-TT-65-995
TT 66-60066

Unclassified report

Unedited rough draft trans. of Patent (USSR) 167 367, pub. 2 Jul 63 appl. no. 844975/26-24.

Descriptors: (*Computer storage devices, Selection), Magnetic core storage, Ferrites, Hysteresis, Electric wire, USSR, Patents

Object of the invention: A method of piercing the selecting matrix of the memory device with linear selection designed on ferrite cores with a rectangular hysteresis loop with the uniting of the energy of a great number of sources which has the distinguishing feature that for the purpose of decreasing the length of the piercing wires, as well as the number of the wires which penetrate each core, the selecting matrix is broken down into a number of blocks of lesser capacity, the piercing of the blocks is accomplished in accordance with a code, the number of bits of which depends on the capacity of the block, and the corresponding coordinates of the winding of the neighboring (in accordance with the coordinates x and y) blocks are connected in sequence. (Author)

**AD-625 295 Fld. 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EXTERNAL STORAGE FOR COMPUTERS,**
by V. I. Adasko, M. M. Kanevskii, and R. R. Pure. 3 Dec 65, 14p. Rept. no. ftd-TT-65-1081
TT 66-60073

Unclassified report

Unedited rough draft trans. of Elektrotekhnika (USSR) n7 p62-4 1964.

Descriptors: (*Computer storage devices, State-of-the-art reviews), Magnetic tape, Punched cards, Magnetic core storage, Thermoplastics, USSR

There are examined the basic characteristics and operating features of storage devices with sequential and random access for modern computers (magtape, disk and punch-card storage). (Author)

**AD-625 369 Fld. 9/2, 5/11**
*BUNKER-RAMO CORP CANOGA PARK CALIF*
**COMPUTER PROCESSING AND CULTURAL DATA: PROBLEMS OF METHOD,**
by Paul L. Garvin. 1962, 22p. Contract AF49 (638)-1128 AFOSR 65-2263

Unclassified report

*Availability: Published in The Use of Computers in Anthropology p120-39 1962. Copies to DDC users only.*

Descriptors: (*Computers, Social sciences), (*Culture, Computers), Data processing systems, Music, Programming (Computers), Flow charting, Computational linguistics, Antropology

The purpose is to consider some crucial aspects of the problems connected with the processing of cultural data on computing equipment. The point of view taken here is that in planning the application of this equipment to a new field of study, certain questions are more closely related to the characteristics of computer applications than to the nature of the problems that are to be studied. One set of questions has to do with the use of the computer as a tool for information processing, and more particularly with the input and output problems that it raises: (1) what type of information is required in order to make the use of the equipment possible, that is, what is needed to make a problem computable. (2) what type of information can be expected as the result of computer use. The second type of question has to do with the way in which the equipment is used, that is, with the actual computer operations: what is the relation of the characteristics of computer programs to the characteristics of the data.

**AD-625 383 Fld. 9/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*ANAGRAM CORP SPRINGFIELD VA*
**PROGRAMMING SYSTEM CL-I EXTENDED (CLIX).**
Final rept., 28 Jun-14 Nov 65,
by Marvin Lautzenheiser. 29 Oct 65, 49p. Rept. no. af (anagram)-1595
Contract AF49 (638)-1595

Unclassified report

Descriptors: (*Programming (Computers), Corrections), Punched cards, Errors

Sets forth corrections, extensions and improvements incorporated in the CL-I Extended (CLIX) Programming System Lp operations MODSAP, DEFRTN, MFEXEC, MFUTIL, CONTBL, DEFPRC, EXCPRC, DEFOBJ, INPOBJ, CHGSOF and PCHSOF. The CLIX Programming System is based on concepts of the CL-IA Programming System. (Author)

**AD-625 417 Fld. 9/2**
**CFSTI Prices: HC $7.00 MF $1.75**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**PROCEEDINGS OF THE SYMPOSIUM ON COMPUTERCENTERED DATA BASE SYSTEMS (2ND).**
Technical memo.,
by C. Baum, and L. Gorsuch. 1 Dec 65, 351p.
Rept. no. sdc-TM-2624/100/00

Unclassified report

Descriptors: (*Data processing systems, Symposia), Data, Computers, State-of-the-art reviews, Command + control systems, Programming (Computers), Data storage systems, Hospitals, Information retrieval, Computer storage devices, Input-output devices, Computer logic, Management control systems

Contents: Tutorial papers: State-of-the-art survey of data base systems; Impact of hardware developments on data base systems; Computer-centered data base systems in support of high military command. Five approaches to the same data base problem: Description of the data base problem, Three COLINGO-like approaches to the data base problem, COLINGO D, COLINGO C-10, and ADAM; Mark III file management system; On-line data management system for the Massachusetts General Hospital; BEST system; and Integrated data store. Description of SDC data base systems demonstrated at symposium: LUCID; General purpose display system; and ECCO and EPIC. Reports of the work group chairmen; Criteria for going on-line; Entry and query language design; File organization; File sharing and protection; Theory of data base problem definition; Criteria for evaluating data management systems; and Recording for analysis, costing, and control.

**AD-625 465 Fld. 9/2**
**CFSTI Prices: HC $5.00 MF $1.00**
*CARNEGIE INST OF TECH PITTSBURGH PA*
**SYNTAX ANALYSIS BY A PRODUCTION LANGUAGE.**
Doctoral thesis,
by Arthur Evans Jr.. 1965, 160p. Contract SD-146

Unclassified report

Descriptors: (*Programming languages, Syntax), (*Syntax, Programming languages), Algorithms, Grammars, Mathematical programming, Computational linguistics, Compilers, Programming (Computers), Analysis

The dissertation presents proofs that two specific translation algorithms operate correctly. Suggestions are given for the application of the techniques developed to translation algorithms considerably more complex than those given. (Author)

**AD-624 864** **See Fld. 6/4**

**AD-624 937** **See Fld. 5/9**

**AD-624 941** **See Fld. 5/9**

**AD-625 005** **See Fld. 5/7**

**AD-625 010** **See Fld. 12/1**

**AD-625 014** **See Fld. 18/8**

**AD-625 029** **See Fld. 5/2**

**AD-625 079** **See Fld. 13/7**

**AD-625 081** **See Fld. 12/1**

**AD-625 115** **See Fld. 20/6**

**AD-625 116** **See Fld. 20/6**

**AD-625 225** **See Fld. 6/4**

**AD-625 322** **See Fld. 12/1**

**AD-625 372** **See Fld. 12/1**

**AD-625 409** **See Fld. 5/2**

**AD-625 488** **See Fld. 12/1**

**AD-625 498** **See Fld. 5/2**

**AD-625 545** **See Fld. 8/11**

**AD-625 547** **See Fld. 8/11**

**AD-625 567** **See Fld. 5/8**

## 9/3. ELECTRONIC AND ELECTRICAL ENGINEERNG

**AD-624 957 Fld. 9/3**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING*
**A TRANSISTORIZED CATHODE-RAY PHASE-SENSITIVE NULL DETECTOR,**
by B. R. Cassidy, and J. H. Simpson. 2 Nov 64, 3p. NRC 8509

Unclassified report

*Availability: Published in IEEE Transactions on Instrumentation and Measurement, vIM-14 n1/2 p75-7 Mar-Jun 1965. Copies to DDC users only.*

Descriptors: (*Measuring devices (Electrical + electronic), Electric currents), Canada, Transformers, Test sets, Semiconductor devices, Cathode-ray tubes, Phase (Electronics), Test equipment, Electric bridges, Voltage

A tuned cathode-ray null detector developed for use with a current transformer test set is described. Apart from the cathode ray tube, the detector is completely transistorized and has been designed to detect signals as low as 20 microvolts at frequencies of 50, 60, and 400 c/s. The third harmonic is down at least 40 dB from the fundamental. (Author)

**AD-624 983 Fld. 9/3**
*ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y*
**A SYNTHESIS METHOD FOR LINEAR TIME-VARYING SYSTEMS.**
Technical rept.,

by N. DeClaris, and N. Liskov. Dec 65, 8p.
Rept. no. eerl-46 ,TR-89
Contract DA-36-039-AMC-00034 (E)
Unclassified report

*Availability: Published in Proceedings of the National Electronics Conference V21 P599-604 1965. Copies to DDC users only.*

Descriptors: (*Linear systems, Synthesis), (*Integral transforms, Synthesis), Dynamics, Fourier analysis, Series, Control systems, Approximation (Mathematics)

The behavior of linear dynamic systems is characterized in general by a set of linear equations that are: (a) differential, (b) integro-differential, or (c) integral. To achieve a desirable excitation-response (input-output) relation, an integral formulation appears to offer a number of distinct advantages in most cases. These advantages are of great importance, especially for realization of time-varying linear systems. This paper thus deals entirely with the synthesis aspects of deterministic, linear, time-varying systems based on integral formulations.

**AD-625 587 Fld. 9/3**
**CFSTI Prices: HC $4.00 MF $0.75**
*ITT KELLOG COMMUNICATIONS SYSTEMS CHICAGO ILL*
**INVESTIGATION OF FAULT DIAGNOSIS BY TRANSFER FUNCTION TECHNIQUES.**
Final technical rept. for 26 Oct 64-26 Sep 65,
by Walter J. Stahl, Thomas K. McBride, and John H. Maenpaa. Nov 65, 119p. Contract AF33 (615)-2302 Proj. AF-8119 Task 811927
APL TR-65-113
Unclassified report

Descriptors: (*Failure (Electronics), Checkout procedures), (*Test methods, Failure (Electronics)), (*Checkout procedures, Failure (Electronics)), (*Functions, Electrical engineering), Topology, Circuits, Linear systems, Malfunctions, Corrections, Programming (Computers)

The program under this contract was directed toward demonstrating the feasibility of fault diagnosis by transfer function techniques for linear electronic circuits. The objective was to be able to diagnose faults to the component level using only available input and output terminals and a minimum number of internal test points. The methodology was to formulate and implement the theories, techniques and computer program required to generate a test procedure to diagnose a general class of linear electronic circuits. The technique investigated is that of observing changes in the breakpoint frequencies and amplitudes of the normal frequency response curves of the circuit under test and relating these changes to the faulty elements so that they may be diagnosed. The validity of this technique is based upon the fact that the breakpoint information together with the gain at any frequency serves to uniquely identify the transfer function of the system. The application of topological formulas to the generation of the symbolic transfer function of the circuit under test, and numerical evaluation of the generated function under normal and simulated failure conditions is the specific technique employed. (Author)

**AD-625 072 See Fld. 9/5**

**AD-625 370 See Fld. 9/5**

**AD-625 392 See Fld. 9/5**

**AD-625 558 See Fld. 20/9**

## 9/4. INFORMATION THEORY

**AD-624 866 Fld. 9/4, 12/1**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**SOME RESULTS ON THE STOCHASTIC SIGNAL PARAMETER ESTIMATION PROBLEM.**
Revised ed.,
by Edward M. Hofstetter. 4 Mar 65, 8p.
Unclassified report

Revision of manuscript submitted 18 Sep 64.

*Availability: Published in IEEE Transactions on Information Theory vIT-11 n3 p422-9 Jul 1965. Copies to DDC users only.*

Descriptors: (*Signals, Statistical analysis), (*Information theory, Stochastic processes), Statistical functions, Radar signals, Noise (Radar), Radar targets, Radio communication systems, Signal-to-noise ratio

The problem of finding maximum-likelihood estimates of the partially or completely unknown autocorrelation function of a zero-mean Gaussian stochastic signal corrupted by additive, white Gaussian noise is analyzed. It is shown that these estimates can be found by maximizing the output of a Wiener estimator-correlator receiver biased by a smoothed version of the output noise-to-signal ratio of the Wiener estimator over the class of admissible autocorrelation functions. For the case where the autocorrelation function is known except for an amplitude scale parameter, an illuminating expression for the CramerRao minimum estimation variance is derived. Detailed study of this expression yields, among other results, an interpretation of the maximum-likelihood estimator as an adaptive processor. (Author)

**AD-625 090 See Fld. 14/2**

**AD-625 197 See Fld. 20/1**

**AD-625 272 See Fld. 12/1**

**AD-625 471 See Fld. 20/12**

## 9/5. SUBSYSTEMS

**AD-624 880 Fld. 9/5**
**CFSTI Prices: HC $4.00 MF $0.75**
*SCANWELL LABS INC SPRINGFIELD VA*
**A LARGE, LOW-COST STEERABLE PLANAR ARRAY.**
Final rept. 1 Apr 64-31 Mar 65,
by Clinton G. Hollins. Aug 65, 106p. Contract AF19 (628)-4039 Proj. AF-4600 Task 460002
AFCRL 65-757
Unclassified report

Descriptors: (*Antenna arrays, Scanning), Very high frequency, Phase shifters, Electronic switches, Costs, Beams (Electromagnetic)

Equipment and techniques developed expressly for the implementation of a low-cost steerable planar array of approximately 10,000 elements and operating in the 100 to 200 mc region of the electromagnetic spectrum are described. Beam steering control along parallel rows is achieved by changing the interelement spacing of radiators proximity coupled to a slow wave structure while a phase shifter of new design permits simple control of the phase of the current supplied to each row, providing a second steering coordinate. Fabrication and installation of the entire array would require approximately $90.00 per element at the middle of the specified frequency range. (Author)

**AD-624 946 Fld. 9/5**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**MICROWAVE GENERATION FROM AVALANCHING VARACTOR DIODES,**
by F. A. Brand, V. J. Higgins, J. J. Baranowski, and M. A. Druesne. 12 Jul 65, 2p.
Unclassified report

*Availability: Published in Proceedings of the IEEE, v53 n9 p1276-7 Sep 1965. Copies to DDC users only.*

Descriptors: (*Varactor diodes, Microwave oscillators), (*Microwave oscillators, Varactor diodes), Avalanche diodes, Gallium alloys, Arsenic alloys, Silicon alloys

The generation of microwave power from various diffused and epitaxial silicon and epitaxial gallium arsenide varactor diodes pulsed well into the avalanche region is discussed.

**AD-624 949 Fld. 9/5, 9/1**
*ARMY ELECTRONICS LABS FORT MONMOUTH N J*
**FORTSCHRITTE AUF DEM GEBIET DER NEBENWELLENBESEITIGUNG IN DIECKNSCHERUNGSSCHWINGEN DEN QUARZPLATTEN IM FREQUENZBEREICH VON 5 BIS 100 MHZ (PROGRESS IN THE AREA OF SECONDARY WAVE ELIMINATION IN THICKNESSSHEAR VIBRATION QUARTZ PLATE IN THE FREQUENCY RANGE BETWEEN 5 TO 100 MHZ),**
by Rudolf Bechmann, and Daniel R. Curran. 28 May 65, 4p.
Unclassified report

Prepared in cooperation with Clevite Corp., Cleveland Ohio. Electronic Research Div. Text in German.

*Availability: Published in Archiv der Elektrischen Ubertragung V19 P499-502 1965. Copies to DDC users only.*

Descriptors: (*Crystal filters, Quartz), (*Suppressors, Frequency), Quartz resonators, Very high frequency, Electrodes, Vibration, Shear stresses, Thickness, West Germany

The suppression of unwanted modes in thickness-shear vibrating AT-cut quartz plates is an essential condition for filter crystals and is dependent on two parameters, the electrode-diameter and the electrode thickness or more precisely the mass loading. The trapped energy concept derived by Mindlin and Shockley furnishes the analytical relationship between these two parameters. Filter crystals operating in the frequency range from 5 to 100 Mc/s and above can be fabricated with a suppression of unwanted modes to at least 40 dB and the parameters of the equivalent electric circuit of these crystals can be chosen from a large range of values. (Author)

**AD-624 951 Fld. 9/5**
*ARMY ELECTRONICS LABS FORT MONMOUTH N J*
**ON OPTIMIZING EFFICIENCY AND BANDWIDTH OF INDUCTIVELY LOADED ANTENNAS,**
by W. P. Czerwinski. 22 Mar 65, 2p.
Unclassified report

*Availability: Published in IEEE Transactions on Antennas and Propagation, vAP-13 n5 p811-2 Sep 1965. Copies to DDC users only.*

Descriptors: (*Helical antennas, Effectiveness), (*Bandwidth, Optimization), Inductance, Dipole antennas, Capacitance

Four antenna configurations were tested and compared for efficiency and bandwidth with a ten foot whip antenna. These configurations were: tapered pitch winding throughout; constant pitch winding throughout; linear conductor above and below the feed-point; and tapered pitch winding with ferrite core termination. The last one met the design objectives.

**AD-624 955 Fld. 9/5**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING*
**PERIODICALLY ADJUSTED FEEDBACK CONTROLS MULTIPLIER PHOTOTUBE,**
by M. D. Watson, and G. R. Donaldson. 1965, 3p. NRC 8374
Unclassified report



799-993 O-66—4

*Availability: Published in Canadian Electronics Engineering, Feb 1965. Copies to DDC users only.*

Descriptors: (*Photomultipliers, Feedback amptifiers), (*Feedback, Control systems), Phototubes, Canada, Gain, Circuits

A negative feedback system is described which regulates gain by sampling the signal. This signal must lie within the amplitude limits of a pen recorder.

**AD-625 016 Fld. 9/5, 20/14**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**ON SURFACE-WAVE COUPLING BETWEEN ELEMENTS OF LARGE ARRAYS.**
Revised ed.,
by John L. Allen. 1 Feb 65, 3p. Rept. no. ja-2493
Contract AF19 (628)-5167 ESD TDR-65-488
Unclassified report

Revision of manuscript submitted 28 Dec 64.

*Availability: Published in IEEE Transactions on Antennas and Propagation Vap13 N4 P638-9 Jul 1965. Copies to DDC users only.*

Descriptors: (*Antenna arrays, Electromagnetic waves), Antenna radiation patterns, Electrical impedance, Antenna components

It is shown that even if surface waves are launched by an element of the array and can propagate across the array face, the effect of such waves on the array impedances vs. scan characteristic will be quite localized. These regions can be avoided by spacing the elements closer than the usual spacing criteria indicates. (Author)

**AD-625 063 Fld. 9/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**A SYMMETRICAL FLIPFLOP,**
by V. S. Ilenko. 8 Dec 65, 6p. Rept. no. FTD-TT-65-1128
TT 65-64847
Unclassified report

Unedited rough draft trans. of Patent (USSR) 162 574, appl. no. 814977/26-9, 23 Jan 63.

Descriptors: (*Relaxation oscillators, Transistors), Resistance (Electrical), Circuits, Patents, USSR

A symmetrical flipflop based on transistors with two inputs and with a common resistance in the emitter circuits is presented which has the distinguishing feature that for the purpose of eliminating the pseudo-operation of the breakdown of one of the transistors into each of its arms, there is connected in parallel a supplementary transistor apiece, while the bases of the latter are joined by cross connection with the collectors of the basic transistors. (Author)

**AD-625 071 Fld. 9/5, 20/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF GENERATING OSCILLATIONS WITH A FREQUENCY WHICH IS DETERMINED BY THE LARMOR PRECESSION FREQUENCY OF NUCLEAR SPINS,**
by R. M. Umarkhodzhaev. 9 Dec 65, 6p. Rept. no. ftd-TT-65-1170
TT 65-64855
Unclassified report

Unedited rough draft trans. of Patent (USSR) 168

Descriptors: (*Oscillators, Nuclear spins), (*Nuclear spins, Precession), Modulation, Magnetic fields, Nuclear magnetic resonance, Patents, USSR

A method is given of generating oscillations with a frequency determined by the frequency of the Larmor precession of nuclear spins which has the distinguishing feature that for the purpose of shorting the feedback one uses a central 'lateral' (collateral) of nuclear magnetic resonance which is formed in the low-frequency modulation of a magnetic field. (Author)

**AD-625 072 Fld. 9/5, 9/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF SEPARATING ONE AMPLITUDE-MODULATED SIGNAL FROM TWO MIXED AM SIGNALS WITH SUPERPOSED SPECTRA, BUT DIFFERENT CARRIERS,**
by Yu. N. Babanov. 9 Dec 65, 9p. Rept. no. FTD-TT-65-1174
TT 65-64856
Unclassified report

Unedited rough draft trans. of Patent (USSR) 165 780, appl. no. 69964-26-9, 2 Mar 61.

Descriptors: (*Demodulators, Amplitude modulation), (*Discriminators, Amplitude modulation), (*Amplitude modulation, Demodulators), Radiofrequency filters, Radio signals, Mixers (Electronic), Frequency converters, USSR

The proposed method is characterized by the fact that for eliminating the disturbance from the original signal coming from an amplifier of intermediate frequency and representing the sum of two AM oscillations with superposed spectra, but with different carriers, there is separated (with the aid of a very-narrow-band filter) the carrying oscillation of that AM oscillation which is looked on as the disturbance. The separated oscillation is transformed in the frequency doubler, after which the obtained oscillation of double frequency is cross-multiplied with the original signal and on the product there is superposed the original signal. By matching the phase of the oscillation of the doubled frequency and the ratio of the amplitudes of the original signal and the mentioned product, the compensation of the mixing AM oscillations is assured. The oscillations contained in the product on frequencies close to the tripled frequency of the carrying oscillations are eliminated by frequency filtrations, and the remainder containing the two AM oscillations with different carriers doubly exceeding the difference between the carrying and original oscillation either are subjected to simple frequency filtration if the spectra of these oscillations are not superposed, or in the opposite case repeatedly subjected to the described treatment, repeating it as many times as are necessary for getting the difference of the carriers at which the spectra of the oscillations can be separated by simple linear filtration.

**AD-625 170 Fld. 9/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB*
**THE AFCRL 29-FT MILLIMETER-WAVE ANTENNA.**
Scientific rept.,
by L. M. Keane. Oct 65, 31p. Rept. no. SR-34
Proj. AF-4610 ,AF-0000 Task 461006 ,00008
AFCRL 65-726
Unclassified report

Descriptors: (*Parabolic antennas, Millimeter waves), (*Millimeter waves, Antennas), Antenna feeds, Reflectors, Gain, Antenna components, Servomechanisms, Tracking, Extremely high frequency

A general description of AFCRL's new 29-ft parabolic antenna is given. This antenna, designed for operation at 35 Gc, has Cassegrain feed optics and a precise reflecting surfdce supported on an elevation over azimuth mount. Design parameters include a gain of 67.5 dB at 35 Gc and a pointing capability of better than =1 arc min under 30-knot wind loads, normal solar loading, and peak accelerations of .012 deg/sq sec. The servo system was designed primarily to track objects traveling at sidereal rates. A limited satellite tracking capability should exist, however. Emphasis is given to engineering aspects of the tower, mount, drive system, and reflector assembly which should provide efficient rf operation and extreme precision in pointing. (Author)

**AD-625 209 Fld. 9/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*SCIENTIFIC-ATLANTA INC GA*
**RECIPROCAL TEM FERRITE PHASE SHIFTERS.**
Quarterly rept. no. 1, 1 Jun-31 Aug 65,
by J. W. Simon, and W. K. Alverson. 31 Aug 65, 80p. Contract DA-28-043-AMC-01381 (E)
Proj. DA-1P6-22001-A057 Task 1P6-22001-A057-02
Unclassified report

Descriptors: (*Phase shifters, Ferrites), Microwave equipment, Coaxial cables, Transmission lines, Impedance matching, C band

The results of a literature search covering phase shifter device theory and square-loop ferrite material considerations are presented. Techniques for accurately measuring phase shift of coaxial type devices at microwave frequencies are discussed along with an analysis of maximum possible errors in two such systems. A system is described which uses commercially available components in conjunction with a pair of high performance isolators to obtain very accurate phase measurements. Initial development work on reciprocal TEM latching phase shifters is reported, with detailed discussions of impedance matching problems, radiation effects, and ferrite geometry considerations. Differential phase shifts obtained at C-band are typically 90 degrees per inch, with insertion loss values ranging between 1.0 and 2.0 db for a 180 degree bit. (Author)

**AD-625 261 Fld. 9/5, 20/14**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**A MICROWAVE NOISE SOURCE OF GAS DISCHARGE FOR CIRCULAR WAVEGUIDES,**
by Chuin-Sheng Lin, and Shih-Wei Shu. 1 Dec 65, 18p. Rept. no. ftd-TT-65-359
TT 66-60057
Unclassified report

Edited translation of Tien Tzu Hsueh Pao (Chinese People's Republic) n1 p23-30 1964.

Descriptors: (*Noise generators, Gas discharges), (*Gas discharges, Noise generators), (*Microwaves, Noise generators), Waveguides, Discharge tubes, Radiofrequency generators, China

The paper describes a new type of gas discharge tube which can be inserted horizontally into a circular waveguide to serve as a standard noise source. Operating in the 3-cm waveband with its terminal short-circuited, the discharge tube gives an excellent matching (VS-WR = 1.10 = 0.05) to the waveguide system and has a stable noise output of 18 = 0.5 db. The result of the present investigation is applicable to the development of noise tubes of the waveguide type for the wavelength regions below 8 mm and above 10 cm. (Author)

**AD-625 310 Fld. 9/5, 20/2**
**CFSTI Prices: HC $5.00 MF $1.00**
*RADIO CORP OF AMERICA NEW YORK DEFENSE ELECTRONIC PRODUCTS*
**TUNABLE SOLID STATE GENERATOR.**
Quarterly rept. no. 1, 1 Jun-31 Aug 65,

by B. Bossard, R. Ernst, S. Yuan, B. Perlman, and P. Torrione. 4 Oct 65, 152p. Rept. no. CR-65-419-17
Contract DA-28-043-AMC-01385 (E) Proj. DA-1P6-22001-A056-04-00

Unclassified report

Descriptors: (*Radiofrequency generators, K band), (*Semiconductor devices, Radiofrequency generators), Miniature electronic equipment, Tuning devices, Microwave oscillators, Transistors, Varactor diodes, Frequency multipliers, X band

Progress is reported on a program to produce a miniature solid-state tunable source in the 16 Gc/s to 16.5 Gc/s frequency band. A one-half-watt fundamental frequency transistor oscillator that is mechanically tunable from 970 Mc/s to 1040 Mc/s has been completed. In addition, an electronically-tunable frequency oscillator that provides 200 mW to 400 mW tunable from 990 Mc/s to 400 mW tunable from 990 Mc/s to 1035 Mc/s has been developed. Transistor oscillator doublers that generate 2.45 watts at 1000 Mc/s and transistor oscillator triplers that generate up to 2.90 watts in the 1250 Mc/s range have been tested. A Bimode varactor tripler has demonstrated an over-all efficiency of 33 percent at an output frequency of 9.9 Gc/s; an output of 230 mW is generated at X-band. A similar Bimode quadrupler was constructed with an efficiency close to 30 percent and an X-band output of 190 mW. The potential of step-recovery diodes as high-order multipliers is also being investigated. A times-10 multiplier has generated 35 mW at X-band.

**AD-625 318 Fld. 9/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*CENTRAL RADIO PROPAGATION LAB BOULDER COLO*
**OPTIMUM NONUNIFORMLY SPACED ANTENNA ARRAYS.**
Final rept., Mar-Sep 65,
by M. T. Ma, and L. C. Walters. 30 Nov 65, 32p.
Contract PRO-S65-534 Proj. 4600 Task 460006
AFCRL 65-830

Unclassified report

Descriptors: (*Antenna arrays, Optimization), Antenna radiation patterns, Configuration

A formulation for synthesizing an optimum nonuniformly spaced but symmetrical array by adjusting both the amplitude excitations and element spacings is given. This is accomplished by applying Haar's theorem which is known in a branch of mathematics. It is shown that the solution obtained according to the method proposed here is optimum in the senses that, with respect to a chosen set of element spacings, (1) the maximum deviation between the synthesized and desired patterns is minimized, (2) the side lobes can be made approximately equal and their level minimum for a specified beamwidth, (3) the side lobe level and beamwidth are not seriously constrained so that a solution better than the Dolph-Chebyshev array may be possible, (4) a minimum number of elements required to synthesize a desired pattern may be determined, and (5) the solution can be unique. (Author)

**AD-625 370 Fld. 9/5, 9/3, 20/12, 11/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*RADIO CORP OF AMERICA CAMDEN N J DEFENSE ELECTRONIC PRODUCTS*
**MICROELECTRONIC SOLID-STATE DISPLAY ASSEMBLY.**
Interim development rept. no. 2, 1 Sep-1 Dec 65.
1 Dec 65, 39p. Contract NObsr-93320 Proj. SR-008-0303 Task 9371

Unclassified report

See also AD-623 138.

Descriptors: (*Microminiaturization (Electronics), Display systems), (*Printed circuits, Intermetallic compounds), (*Cadmium alloys, Selenium alloys), (*Intermetallic compounds, Printed circuits), Solid state physics, Molecular electronics, Electroluminescence, Sandwich construction, Semiconductors, Hysteresis, Electrical conductance, Test equipment (Electronics), Manufacturing methods, Costs, Feasibility studios, Subminiature electronic equipment

The hysteresis effect in cadmium selenide and the method of utilizing the effect in a CdSe-EL (electroluminescent) panel are described. A uniformity condition for determining whether a panel will operate properly is derived, and a possible method of coupling a CdSe-EL panel to the ELF driver equipment is given. Configuration and fabrication studies have been carried out. It appears that packing density is an important parameter in CdSe-EL panels. (Author)

**AD-625 375 Fld. 9/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**A SHAPED REFLECTOR AS A PRIMARY FEED FOR HAYSTACK.**
Technical note,
by A. Sotiropoulos. 30 Sep 65, 25p. Rept. no. tn-1965-15
Contract AF19 (628)-5167 Proj. AF-649L ESD TDR-65-457

Unclassified report

Descriptors: (*Antenna feeds, Reflectors), (*Parabolic antennas, Antenna feeds), Antenna apertures, Polarization, Waveguides, Configuration, Radiofrequency power, Effectiveness, Antenna radiation patterns

The paper describes a technique for obtaining high aperture efficiency in the Haystack 120-foot diameter Cassegrain antenna system. The approach used seeks to maximize the percentage of power intercepted by the hyperboloidal subreflector of the Cassegrain antenna system by shaping its primary feed radiation pattern. The primary feed configuration is a linearly polarized waveguide feed illuminating a specially shaped reflector. A number of theoretical antenna models were calculated and one of these antennas (a 30 wavelength diameter shaped reflector at 7750 Mcps) was fabricated and evaluated. Calculated estimates of percentage of primary feed power intercepted by the subreflector and Cassegrain aperture efficiency are presented. (Author)

**AD-625 392 Fld. 9/5, 9/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*NEW YORK UNIV N Y LAB FOR ELECTRO-SCIENCE RESEARCH*
**STEADY-STATE AND TRANSIENT RESPONSE OF ARBITRARY TAPERED DISTRIBUTED RC NETWORKS WITH LUMPED LOAD TERMINATIONS.**
Technical rept.,
by John J. Kelly, and Mohammed S. Ghausi. Oct 65, 25p. Rept. no. scientific-22 .TR-400-120
Contract AF (628)-379 Proj. AF-5628 Task 562806
AFCRL 65-803

Unclassified report

Descriptors: (*Integrated circuits, Mathematical analysis), (*Electrical networks, Mathematical analysis), Electrical engineering, Topology, Electrical properties, Distribution functions, Transients, Stability

The network properties of arbitrary tapered distributed RC networks are obtained in series and product forms using techniques based on the work of Carson and Rayleigh. The network functions so obtained are readily interpreted using pole-zero patterns and the equivalent dominant pole-zero viewpoint. Steady-state frequency response and transient response of terminated distributed RC twoports are shown to be easily obtained using the equivalent dominant pole and excess phase approximation. The approach is applicable to tapered networks terminated in lumped or distributed loads. (Author)

**AD-625 420 Fld. 9/5, 20/12**
**CFSTI Prices: HC $1.00 MF $0.50**
*CHATHAM ELECTRONICS DIV TUNG-SOL ELECTRIC INC LIVINGSTON N J*
**HIGH SPEED POWER AMPLIFIER USING AN ELECTRON SWITCHED P-N JUNCTION.**
Quarterly interim development rept. no. 2, 27 Aug-27 Nov 65,
by Nelson E. Ake. 27 Nov 65, 21p. Contract NObsr-93306

Unclassified report

See also AD-625 420.

Descriptors: (*Solid state physics, Power amplifiers), (*Power amplifiers, Diodes (Semiconductor)), (*Diodes (Semiconductor), Power amplifiers), Semiconductor devices, Performance (Engineering), Leakage (Electrical), Pulse amplifiers, Silicon, Boron, Penetration

A bare contoured junction does not hold up under a combination of vacuum and temperatures above 90C in the test chamber. Planar junction diodes were made which withstood a combination of vacuum and a temperature of 150C for a period in excess of 1000 hours. Limited results were obtained in making large area diodes either planar or open junction when the penetration of the rectifying junction is greater than 6 microns. The feasibility of selectively etching a dice down to within 2-3 microns of the junction was demonstrated. (Author)

**AD-625 522 Fld. 9/5**
*DEFENCE RESEARCH MEDICAL LABS TORONTO( ONTARIO) SENSORY CAPACITIES SECTION*
**A SEALED SWITCH.**
Revised ed.,
by R. A. Strong. 29 Mar 65, 2p.

Unclassified report

Revision of manuscript received 15 Feb 65.

*Availability: Published in Journal of Scientific Instruments v42 p506-7 Jul 1965. Copies to DDC users only.*

Descriptors: (*Electronic switches, Intercommunication systems), Relays, Canada

The note describes a press-to-talk intercommunications switch designed for safe operation in gaseous environments of various pressures, humidities and composition, and under water at pressures up to one hundred and fifty pounds per square inch.

**AD-625 549 Fld. 9/5, 17/2.1**
**CFSTI Prices: HC $7.00 MF $1.50**
*LENKURT ELECTRIC CO INC SAN CARLOS CALIF*
**MULTIPLEXER SET AN/FCC-17 ( ) AND MULTIPLEXER SET AN/MCC-12.**
Final engineering technical rept. Phase B,
by F. N. Easley, and R. B. Anderson. 29 Oct 65, 307p. Contract AF30 (635)-11188 RADC TDR-63-440-V2

Unclassified report

See also AD-618 424.

Descriptors: (*Communication equipment, Multiplex), (*Multiplex, Communication equipment), Telephone communication systems, Reliability (Electronics), Performance (Engineering), Modules (Electronic), Radio communication systems

The multiplexer set was designed and fabricated for reliability under extreme conditions of operation. Reliability testing under actual field conditions and with military maintenance indicates an MTBF in excess of 411 hours, although the calculated MTBF for a 60-channel system is 125 hours.

Further field experience has shown the actual MTBF to be better than 800 hours and the availability of any channel to be 99.98 percent. The availability of a particular channel is 99.998 percent.

**AD-625 576 Fld. 9/5**
*CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB*
**A UNIFIED THEORY OF SYNTHESIS WITH UNSYMMETRIC FOUR-ELEMENT LOSSLESS LATTICES,**
by C. W. Ho, and I. T. Frisch. 1963, 12p. Contract AF-AFOSR-139-64 AFOSR 65-2444
Unclassified report

*Availability: Published in IEEE International Convention Record pt7 p147-57 1965. Copies to DDC users only.*

Descriptors: (*Networks, Synthesis), Functions, Circuits, Capacitance, Inductance, Electrical impedance, Matrix algebra

A complete theory is given for the use of unsymmetric lossless lattices with four elements in the cascade synthesis of transfer functions and driving-point functions. The major results are a new lattice equivalent for a Darlington-C section under specified constraints on the driving-point impedance and a new, simple condition of applicability for the Miyata Lattice. For both lattices explicit formulas for the element values are developed in terms of the given impedance. (Author)

**AD-624 887 See Fld. 8/2**

**AD-624 925 See Fld. 20/5**

**AD-625 122 See Fld. 20/14**

**AD-625 316 See Fld. 14/2**

**AD-625 340 See Fld. 5/1**

## 9/6. TELEMETRY

**AD-624 936 Fld. 9/6, 22/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**TELEMETRY ANTENNA FOR LINCOLN EXPERIMENTAL SATELLITES LES-1 AND LES-2.**
Technical rept.,
by Mark E. Devane, and Milton L. Rosenthal. 22 Jun 65, 49p. Rept. no. tr-394
Contract AF19 (628)-500 Proj. AF-649L ESD TDR-65-239
Unclassified report

Descriptors: (*Telemetering antennas, Satellite antennas), (*Satellite antennas, Telemetering antennas), Transmission lines, Antenna radiation patterns, Very high frequency, Performance (Engineering), Dipole antennas, Programming (Computers), Impedance matching

The telemetry antenna used on the first two Lincoln Experimental Satellites consists of four short stubs equally spaced around, and parallel to, the spin axis of the satellite. A detailed description of the antenna and its transmission-line system is presented. Theoretical and model studies leading to the design of this antenna are discussed. Calculated and measured performance data are presented and compared. (Author)

**AD-625 118 See Fld. 14/2**

## 10/1. CONVERSION TECHNIQUES

**AD-625 198 Fld. 10/1, 20/12, 11/6, 11/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**MATERIALS FOR HIGH-TEMPERATURE ENERGY CONVERTERS: ANNOTATED BIBLIOGRAPHY.**
Rept. no. 1 on ATD work assignment no. 79, task 22,
by Michael Slesarenko. 9 Dec 65, 33p. Rept. no. atd-65-112
TT 66-60037
Unclassified report

Based on Soviet open-source materials for 1955-1960. Rept. on Surveys of Soviet Scientific and Technical Literature.

Descriptors: (*Materials, Energy conversion), (*Energy conversion, Materials), (*Bibliographies, Energy conversion), High-temperature research, USSR, Abstracts, Indexes, Semiconductors, Alloys, Ceramic materials, Intermetallic compounds

This annotated bibliography is based on Soviet opensource materials available at the Aerospace Technology Division and the Library of Congress and covers the years 1955 through 1960. Information not confined to the assigned subject has been included because of its broad implications for study in this field. Titles of Soviet monographs are given in transliterated form, followed by the English translation. Library of Congress call numbers are included at the end of an entry when the item is cataloged and available in the collections of the Library. Call numbers of journals and periodicals frequently referred to in the bibliography are given once, at their first appearance. Translations are indicated when available, and abstracts already available in English are indicated where applicable. (Author)

**AD-625 265 Fld. 10/1, 20/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**FREE HEAT CONVECTION IN TURBINE CLEARANCE,**
by V. A. Arkad'yev. 30 Nov 65, 7p. Rept. no. ftd-TT-65-1135
TT 66-60059
Unclassified report

Edited trans. of Akademiya Nauk URSR, Kiev. Dopovidi, n2 p204-6 1965.

Descriptors: (*Convection (Heat transfer), Turbine parts), (*Turbine parts, Convection (Heat transfer)), Rotor blades (Turbomachinery), Partial differential equations, USSR

Since the convective heat transfer in turbine rotor clearances must be taken into account, the problem of free heat convection in axisymmetrical clearances with mass forces of variable acceleration is discussed, and methods of solution are outlined. (Author)

**AD-625 418 Fld. 10/1, 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA INST OF TECH PASADENA HYDRODYNAMICS LAB*
**HYDRODYNAMICS OF TURBOMACHINES.**
Final rept.,
by Allan J. Acosta. Nov 65, 15p. Rept. no. e-79.9
Contract Nonr-220 (24) Proj. NR-062-010
Unclassified report

Descriptors: (*Turbines, Hydrodynamics), (*Turbopumps, Hydrodynamics), (*Cavitation, Machines), Cascade structures, Water tunnels, Design, Theory, Fluids

The principal objective was to understand the basic features of the flow in various types of turbomachines and where possible to use such results in the development of design theories. The major emphasis was placed upon problems of cavitation in axial machines and certain theoretical as well as experimentally related phenomena. Three projects were undertaken: The measurement and observation of cavitating flows in axial inducer pumps, the observation of cavitation and cavitation inception in fluids other than water, and the observation and measurement of forces on the vanes of a cavitating cascade in a water tunnel. (Author)

## 10/2. POWER SOURCES

**AD-624 913 Fld. 10/2, 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**RADIAL FLOW OF AN ELECTROCONDUCTIVE GAS IN A MOVING MAGNETIC FIELD,**
by E. I. Yantovskii. 17 Nov 65, 8p. Rept. no. ftd-TT-65-1659
TT 65-64820
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie, n2 p114-5 1961.

Descriptors: (*Magnetohydrodynamic generators, Gas flow), Electrical conductance, Magnetic fields, Magnetohydrodynamics, USSR, Disks

A discussion is given of one of the problems that arise in the choice of rational system of a magnetic gasdynamic machine which converts part of the energy of a high-temperature flow of gas into electric energy.

**AD-625 127 Fld. 10/2, 7/4**
**CFSTI Prices: HC $3.00 MF $0.50**
*ENGELHARD INDUSTRIES INC NEWARK N J RESEARCH AND DEVELOPMENT DIV*
**FUEL CELL CATALYSTS.**
Quarterly rept. no. 1, 1 May-31 Jul 65,
by O. J. Adlhart, A. J. Hartner, and J. G. Cohn. 31 Jul 65, 52p. Contract DA-28-043-AMC-01286 (E) Proj. DA-1C0-14501-A-34A Task 1C0 14501A34A00
Unclassified report

Descriptors: (*Fuel cells, Catalysts), (*Catalysts, Fuel cells), Mass transfer, Mathematical analysis, Configuration, Diffusivity, Reaction kinetics, Carbon, Boron compounds, Carbides, Platinum, Platinum alloys, Ruthenium alloys, Electrodes, Oxidation, Propanes, Hydrocarbons, Fuels

A mathematical analysis of mass transport to the catalyst pore walls was performed indicating wide and short pores being the desirable geometric configuration. The optimum numerical values of length and radius are dependent on the diffusivity and the reaction rate constant. A series of low porosity carbon carriers and fine grid boron carbide samples were investigated for the support of platinum and platinum-ruthenium alloys. Owing to a defect surface structure boron carbide provides a better dispersion of platinum than obtainable with carbon. The crystallite size of platinum-ruthenium alloys on the other hand appears to be primarily dependent on the ruthenium content and less affected by the supporting surface. The performance of catalysts for the oxidation of methanol and propane does not necessarily correlate with the degree of metal dispersion indicated by the crystallite size. The ultimate performance of the catalyst is significantly affected by the porosity of the carrier and the shape and size of the catalyst particles. Performance declines considerably with increasing porosity of the carrier, particularly with propane. Carriers of very small particle size are undesirable as they adversely affect the porosity of the catalyst layer on the electrode. (Author)

**AD-625 183 Fld. 10/2**
**CFSTI Prices: HC $4.00 MF $0.75**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*

**AUTOMATIC CONTROL OF POWER OF HYDROELECTRIC STATIONS BY CURRENT FLOW,**
by V. A. Bogomolov. 3 Dec 65, 108p. Rept. no. ftd-TT-65-1153
TT 66-60027

Unclassified report

Unedited rough draft trans. of mono. Avotomaticheskoe Regulirovanie Moshchnosti Gidrostantsii po Bodotoki, Moscow, 1950 107p.

Descriptors: (*Electric power production, Automation), Control systems, Hydraulic systems, Operations research, USSR

The book describes methods and systems of automatic control of power of hydroelectric stations by flow, either by current flow or by forebay water height. The text includes elements of automatic devices, several systems of power control, beginning with the simplest. Combined control of power and velocity is considered. The conditions for stable control are indicated, as well as the results of laboratory tests of control systems. An automatic operator of the hydraulic unit is described. Theoretical consideration of systems of power control by flow is based on the classical control theory investigated by I. A. Yvshnegradskiy, N. Ye. Zhukovskiy and others. The general exposition of the theory of control is not given in the book, as it is assumed that the reader is acquainted with it. This book has been written for engineers of designing institutes and operational personnel working in the field of automation of hydroelectric stations, as well as for students in engineering colleges. (Author)

**AD-625 186 Fld. 10/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF PROTECTING THE WORKING SURFACE OF SOLAR BATTERIES,**
by F. Kh. Nabiullin, M. Gertsik, and N. N. Gibadullin. 30 Nov 65, 4p. Rept. no. ftd-TT-65-1142
TT 66-60030

Unclassified report

Unedited rough draft trans. of Patent (USSR) 167 263, appl. no. 855530/24-7, 5 Sep 63.

Descriptors: (*Solar cells, Reflectors), USSR, Patents, Surfaces, Solar collectors, Configuration

The object of the invention is a method of protecting the working surface of solar batteries which contain photoelectric converters and concentrators. To eliminate damage from micrometric dust and particles of high energy the indicated converters are set up with the back surface to the light flux and concentrators are located in such a way that the light flux reflected from them falls on the active surface of the converters. (Author)

**AD-625 440 Fld. 10/2, 18/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL RESEARCH LAB WASHINGTON D C*
**RADIATION DAMAGE IN SILICON SOLAR CELLS FROM 4.6-MEV PROTON BOMBARDMENT.**
Final rept.,
by R. L. Statler. 15 Nov 65, 45p. Rept. no. nrl-6333
Proj. SF-013-12-04-4533 ,SR-007-11-01-0549

Unclassified report

See also AD-608 213.

Descriptors: (*Solar cells, Silicon), (*Proton bombardment, Solar cells ), (*Radiation damage, Solar cells), Electrical properties, Photoelectric effect, Satellites (Artificial), Power supplies, Degradation

A study was made of the radiation damage in ten types of silicon solar cells as a result of 4.6-Mev proton bombardment. The cells comprised such types as p/n cells, n/p cells with different bulk-resistivities, planar cells, and drift-field cells. A comparative analysis was made of the radiation-induced degradation in these cells as a function of short-circuit current, maximum power output, minority-carrier diffusion length, and photovoltaic spectral response. The p/n cells were found to be more sensitive to radiation damage than any type of n/p cell in this study. In the n/p cells, there is a definite trend toward increasing radiation resistance accompanying increasing values of bulk resistivity, up to 10 ohm-cm. The drift-field solar cells exhibit a further improvement in radiation resistance beyond that of the other types of n/p cells. (Author)

**AD-625 478 Fld. 10/2, 13/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*WESTINGHOUSE ELECTRIC CORP LIMA OHIO AEROSPACE ELECTRICAL DIV*
**100 WATT THERMOELECTRIC POWER SYSTEM FOR BUOY APPLICATIONS.**
Monthly progress rept. no. 18, 11 Nov-11 Dec 65.
Dec 65, 4p. Contract N600 (61533)61992

Unclassified report

Descriptors: (*Thermoelectricity, Buoys), (*Buoys, Power supplies), Electric power production, Thermocouples, Generators, Marker lights, Heat sinks, Temperature control, Model test

A laboratory model of the cascaded thermopile was evaluated under simulated hot day conditon. A comparison of the test results with the predicted values is presented.

**AD-625 575 Fld. 10/2, 20/9**
**CFSTI Prices: HC $3.00 MF $0.75**
*PLASMA LAB UNIV OF ARKANSAS FAYETTEVILLE*
**INTERACTION OF PLASMA FLOWS AND MAGNETIC FIELDS.**
Final technical rept. 15 Nov 63-1 Jun 65,
by Denys O. Akhurst. Jul 65, 79p. Rept. no. uapl-24
Contract DA-23-072-AMC-168 (Z)

Unclassified report

Descriptors: (*Magnetohydrodynamics, Electric power production), (*Electric power production, Magnetohydrodynamic generators), (*Magnetohydrodynamic generators, Plasma physics), Gas flow, Magnetic fields, Electrical properties, Superconductors, Plasma generators, Electrical engineering, Energy conversion

The report deals with power generation through the interaction of plasmas and magnetic fields. The study includes both theoretical and experimental work in magnetohydrodynamics and superconductivity.

**AD-625 499 See Fld. 21/8**

**AD-625 586 See Fld. 18/10**

## 11/1. ADHESIVES AND SEALS

**AD-625 176 See Fld. 7/3**

**AD-625 228 See Fld. 13/8**

**AD-625 603 See Fld. 7/4**

## 11/2. CERAMICS, REFRACTORIES, AND GLASSES

**AD-624 874 Fld. 11/2, 18/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*FOOTE MINERAL CO BERWYN PA*
**RADIATION ABSORBING GLASS.**
Final research rept., 27 Jun 64-27 Oct 65,
by John H. Fishwick. 27 Oct 65, 28p. Contract DA-36-038-AMC-1729 (A) Proj. OMS-5523.11.44.00.06 FA R-1778

Unclassified report

Descriptors: (*Glass, Shielding), (*Shielding, Glass), Absorption, Lead compounds, Lithium compounds, Boron compounds, Silicon compounds, Oxides, Optical glass, Neutrons, Gamma rays

The regions of glass formation in the system Li20-B203-Pb0-Si02 are determined at the levels. of 10, 15, and 20 wt. % Li20. Three compositions are selected at the levels of 10, 30, and 50 wt. % Pb0 as potential glasses for the use in the optical system of a radiation protected pod. The manufacture of these three glasses is described and their properties are reported. (Author)

**AD-625 296 Fld. 11/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**MECHANICAL STRENGTH OF HIGHLY ALUMINOUS CERAMIC,**
by N. L. Polyakova, and T. P. Mikhailova. 30 Nov 65, 13p. Rept. no. ftd-TT-64-1094
TT 66-60074

Unclassified report

Unedited rough draft trans. of Steklo i Keramika (USSR) v11 n3 p16-8 1954.

Descriptors: (*Ceramic materials, Mechanical properties), (*Aluminum compounds, Oxides), USSR, Corundum, Annealing, Deformation, Ceramic coatings

**AD-625 458 Fld. 11/2, 13/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*MELPAR INC FALLS CHURCH VA*
**FRACTURE OF GYPSUM PLASTERS AND CEMENT MORTARS BY DYNAMIC LOADING.**
Rept. for 8 Jun 64-1 Jul 65,
by Charles W. Martin. Dec 65, 80p. Contract AF29 (601)-6420 Proj. AF-5710 Task 13.144
WL TR-65-140

Unclassified report

Descriptors: (*Gypsum, Fracture (Mechanics)), (*Cements, Fracture (Mechanics)), Loading (Mechanics), Strain (Mechanics), Tensile properties, Brittleness, Experimental data

An experimental study was made of influence of strain magnitude and strain duration on dynamic fracture in uniaxial tension of low-strength gypsum plaster, highstrength gypsum plaster, high early strength portland cement mortar, and ordinary portland cement mortar. Dynamic test specimens were circular cylindrical bars with diameters ranging from 0.9 to 1.2 inches and lengths ranging from 18 to 58 inches. Static test specimens 2 inches long were cut from the long bars. A special loading device, designed and constructed by Melpar, generated a compressive pulse by longitudinal impact of two metal bars and applied the pulse to one end of the dynamic test specimens. The compressive pulse was reflected at the free end of specimens as a tensile pulse and caused fracture in tension at a section near the middle. Time from zero strain to maximum tensile strain varied from 10 to 35 microseconds, and total duration of tensile strain varied from 20 to 430 microseconds with few exceptions. All materials withstood tensile strains two to three times the static fracture strain for short periods. The straining time required to cause fracture varied with strain magnitude. (Author)

**AD-625 096 See Fld. 20/13**

**AD-625 198 See Fld. 10/1**

**AD-625 550 See Fld. 20/12**

## 11/3. COATINGS, COLORANTS, AND FINISHES

**AD-624 896 Fld. 11/3, 11/9, 13/10.1**
**CFSTI Prices: HC $1.00 MF $0.50**
*UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER*
**PROTECTIVE COATINGS FOR DEEP SUBMERGENCE VESSELS.**
Quarterly rept. no. 7, 6 Sep-5 Dec 65,
by A. S. Glowacki. 16 Dec 65, 13p. Contract NObs-90246 Proj. SR-007-03-04 Task 1008
Unclassified report

Descriptors: (*Submarine hulls, Plastic coatings), (*Epoxy plastic, Coatings), (*Plastic laminates, Submarine hulls), (*Coatings, Submarine hulls), Glass textiles, Reinforcing materials, Fatigue (Mechanics), Surface properties, Thickness, Creep strength, Deep submergence, Composite materials

Glass-reinforced plastic (GRP) laminates brush coated with a 50% solids epoxy solution were fatigued for several thousand cycles between 0 and 7,000 psig without evidence of coating/substrate interface failure. The epoxy coating must be reasonably thin to prevent failure during hydrostatic pressurization. (Author)

**AD-624 993 Fld. 11/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*SPRINGFIELD ARMORY MASS*
**DEVELOPMENT OF A FIXTURE AND A PROCEDURE FOR HARD-ANODIZING THE SURFACES OF A LONG ALUMINUM TUBE WITH A DEEP BLIND-HOLE.**
Technical rept.,
by M. S. Spivak. 4 Oct 65, 22p. Rept. no. sa-TR18-1095
Proj. AF-D7-3-20037-01-D7-M6
Unclassified report

Descriptors: (*Aluminum, Anodic coatings), (*Anodic coatings, Aluminum), (*Pipes, Anodic coatings), Positioning devices (Machinery), Processing

A rack was designed and a method developed for the hard-anodizing of exterior and interior diameters of a long tube. The development of the procedure was complicated by the necessity of hard-anodizing the interior diameter of an extremely deep blind-hole. The design of the fixture is discussed and the method is outlined. (Author)

**AD-625 286** **See Fld. 11/9**

**AD-625 386** **See Fld. 17/4**

**AD-625 442** **See Fld. 22/2**

## 11/4. COMPOSITE MATERIALS

**AD-624 912 Fld. 11/4, 20/12, 8/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**THE SYNTHESIS OF A SEMI-CONDUCTING COMBINATION OF MATERIALS BY THE METHOD OF RADIATION OF GASEOUS PHASE INFUSED POLYMERIZATION,**
by A. V. Vlasov, and P. Ya. Glazunov. 26 Nov 65, 9p. Rept. no. ftd-TT-65-1104
TT 65-64819
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady, v158 n1 p141-2 1964.

Descriptors: (*Semiconductors, Fibers), (*Fibers, Semiconductors), (*Glass textiles, Semiconductors), (*Acrylonitrile polymers, Semiconductors), Synthesis (Chemistry), Polymerization, Radiation chemistry, Mechanical properties, Alkynes, USSR

A method is given for obtaining semiconducting composites with high mechanical durability. Basically the process consists of irradiating glass fibers in the presence of acetylene or acrylonitrile.

## 11/5. FIBERS AND TEXTILES

**AD-625 030 Fld. 11/5, 11/9, 21/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*HERCULES RESEARCH CENTER WILMINGTON DEL*
**INFLUENCE OF ENVIRONMENT ON ROVING AND LAMINATE PROPERTIES,**
by J. T. Paul,Jr., and J. B. Thomson. 1964, 26p.
Unclassified report

Descriptors: (*Glass textiles, Aging (Materials)), (*Reinforcing materials, Glass textiles), Environmental tests, Storage, Degradation, Mechanical properties, Filaments, Filament wound construction, Rocket cases, Epoxy plastics, Laminates, Chemical properties

The paper discusses work done on the effect of environmental conditions, primarily on Owens-Corning's HTS-S glass roving, before and during filament winding. During storage, irreversible changes have been noticed in the HTS-S roving. Stiffness and ribbonization increase with time, rather rapidly at slightly elevated ambient temperatures. These physical property changes have been shown to cause variations in filament windings made from the aged glass. Chemical changes, responsible for the physical ones, have been identified and means of controlling both have been found.

**AD-625 255 Fld. 11/5, 13/13**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY NATICK LABS MASS*
**THE BIAXIAL STRESS-STRAIN BEHAVIOR OF FABRICS.**
Technical rept.,
by Constantin J. Monego. Nov 65, 27p. Rept. no. me-4
Proj. 1MG624101D503 Task 1MG624101D50301
Unclassified report

Descriptors: (*Textiles, Stresses), Strain (Mechanics), Loading (Mechanics), Tents, Nylon, Plastic coatings, Inflatable structures

A comparison is made of the stress-strain response of a fabric in uniaxial stress and three loading conditions in biaxial stress. The results of the stress-strain tests were also compared with strain measurements made on a full-size tent. The results of the biaxial tests were found in better agreement with the stress-strain response in the full-size tent than the uniaxial tests. A suggestion is made for the development of a theory for predicting the biaxial stress-strain behavior of a fabric. This development will include the selection of a governing equation for the perfectly elastic state and finding the expressions needed to define the variables of the equation for a nonelastic material. (Author)

## 11/6. METALLURGY AND METALLOGRAPHY

**AD-624 905 Fld. 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PROPERTIES AND USES OF RHENIUM,**
by K. B. Povarova, and M. A. Tylkina. 10 Nov 65, 10p. Rept. no. ftd-TT-65-976
TT 65-64812
Unclassified report

Unedited rough draft trans. of Byulleten Tekhniko-Ekonomicheskoi Informatsii (USSR) n9 p7-11 1963.

Descriptors: (*Rhenium, Physical properties), USSR, Rhenium alloys, Heat-resistant metals + alloys, Thermocouples, Corrosion resistance, Semiconductors, Superconductors, Welding, Resistance (Electrical), Electronic equipment

**AD-624 908 Fld. 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**MUTUAL SOLUBILITY OF COPPER AND MOLYBDENUM AND CERTAIN PROPERTIES OF ALLOYS OF MOLYBDENUM WITH COPPER,**
by M. L. Baskin, A. V. Savin, V. I. Tumanov, and Yu. A. Eiduk. 9 Nov 65, 11p. Rept. no. ftd-TT-65-1009
TT 65-64815
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Otdelenie Tekhnicheskikh Nauk. Izvestiya: Metallurgiya i Toplivo, n4 p111-4 1961.

Descriptors: (*Copper, Solubility), (*Molybdenum alloys, Copper alloys), USSR, Copper alloys, Powder metallurgy, Microstructure, Resistance (Electrical), Thermal expansion, Impurities, Solid solutions

The lattice constants of the individual phases, resistivities and coefficients of linear expansion were determined for Mo-Cu alloys (1.5-14% by weight of Cu) obtained by powder-metallurgical methods at a sintering temperature of 1600-1700C. Data were obtained indicating formation of a solid solution of copper in molybdenum. The solubility of copper in molybdenum at 950C is about 1.5% by weight. The influence of carbon, silicon, silicon dioxide and nickel impurities on certain properties and the structure of the Mo-Cu alloys was established. (Author)

**AD-624 911 Fld. 11/6, 13/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**A STUDY OF ANTIFRICTION ALLOYS OF THE 'ALCUSIP' TYPE,**
by M. V. Dumchus, and K. M. Stroeva. 26 Nov 65, 13p. Rept. no. ftd-TT-65-1073
TT 65-64818
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Tsvetnaya Metallurgiya (USSR) v7 n5 p114-8 1964.

Descriptors: (*Aluminum alloys, Antifriction bearings), (*Antifriction bearings, Aluminum alloys), USSR, Copper alloys, Lead alloys, Silicon alloys, Iron alloys, Castings, Microstructure, Wear resistance

Alcusip castings over 80 mm in diameter have intolerable liquation of the lead over their height. The microstructure of alcusip is characterized by considerable nonuniformity. The ground mass - the ferrous component AlxFeySiz with CuAl2 crystals - is comparatively hard, while the inclusions of lead and the solid solution of copper in aluminum are soft. As the lead content in the alcusip increases, the strength and hardness decline and the relative elongation increases. Alcusip alloys show wear resistance inferior to that of B-16 alloy. Among the alcusip alloys, AMSK-1 shows the best resistance to wear. Alcusip alloys might be used as a replacement for bronze in light-duty bearings, when the specific pressure is of the order of 20 kg/sq cm and the speed below 3 m/sec. The value of the bearing-materials characteristic Pv < 60 kg.m/sq cm.sec, for the alcusip alloys. (Author)

**AD-624 967 Fld. 11/6**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*

**THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM,**
by J. B. Taylor, L. D. Calvert, and M. R. Hunt.
2 Jun 65, 8p. NRC 8611

Unclassified report

*Availability: Published in Canadian Journal of Chemistry v43 p3045-51 1965. Copies to DDC users only.*

Descriptors: (*Tungsten alloys, Arsenic alloys), (*Molybdenum alloys, Arsenic alloys), (*Arsenic alloys, Refractory metal alloys), Canada, Intermetallic compounds, Phase studies, X-ray diffraction analysis, Single crystals, Diffraction analysis, Powder metals

Binary alloys in the systems tungsten-arsenic and molybdenum-arsenic have been annealed at temperatures between 600 and 1 000C and, after quenching, examined by X-ray diffraction techniques. The only intermediate phases observed are WAs2, W2As3, MoAs2, Mo2As3, and Mo5As4. No solid solubility was detected in the elements or the compounds. The diarsenides are monoclinic, C2, and have the NbAs2 structure. WAs2, a = 9.085 = 0.002 A, b = 3.318 = 0.002 A, c = 7.690 = 0.002 A, beta = 119 deg 31 min = 2 min, MoAs2, a = 9.07 A, b = 3.30 A, c = 7.73A, beta = 119 deg 20 min. The X2As3 compounds are monoclinic, condensed diffraction symbol C* /*; W2As3, a = 13.346 = 0.002 A, b = 3.278 = 0.002 A, c = 9.599 = 0.002 A, beta = 124 deg 48 min = 2 min; Mo2As3, a = 13.339 = 0.002 A, b = 3.240 = 0.002 A, c = 9.628 = 0.002 A, beta = 124 deg 31 min + 2 min. Mo5As4 is tetragonal I4/m, with the Ti5Te4 structure, a = 9.595 = 0.001 A, c = 3.284 = 0.002A. Data for MoAs2 and Mo5As4 confirm or amplify previous reports. In contrast to other reports, MoAs and W2As were not observed. W4As5 and Mo4As5, which have been mentioned briefly elsewhere, are here identified as W2As3 and Mo2As3. (Author)

**AD-624 970 Fld. 11/6**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS*
**THE EFFECT OF PRESSURE AND TEMPERATURE ON THE ELECTRICAL RESISTANCE OF RUBIDIUM AND CAESIUM,**
by J. S. Dugdale, and D. Phillips. 4 Mar 65, 22p. NRC 8624

Unclassified report

*Availability: Published in Proceedings of the Royal Society, A, v287 p381-402 1965. Copies to DDC users only.*

Descriptors: (*Rubidium, Resistance (Electrical)), (*Cesium, Resistance (Electrical)), Canada, Measurement, Pressure, Temperature, Differential equations

Measurements were made of the electrical resistivity of rubidium and caesium at temperatures between 1.5 and 300K and at pressures up to 3000 atm. From the results the ideal resistivity and its pressure derivative both at constant pressure and at constant density was calculated. The results are compared with those of the lighter alkali metals and with theoretical predictions. (Author)

**AD-624 987 Fld. 11/6**
**CFSTI Prices: HC $3.00 MF $0.75**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY*
**INVESTIGATION OF SOLIDIFICATION OF HIGHSTRENGTH STEEL CASTINGS.**
Interim rept. 1 Oct 63-30 Sep 64,
by R. V. Barone, H. D. Brody, and M. C. Flemings. 30 Sep 64, 84p. Contract DA-19-020-AMC-5443 (X) Proj. DA-1A02440A110
AMRA CR64-04/3

Unclassified report

Descriptors: (*Castings, Iron alloys), (*Iron alloys, Castings), Steel, Nickel alloys, Freezing, Metallography, Photomicrography, Surface properties, Numerical analysis, Crystal growth

A numerical technique was employed to compute microsegregation in alloys in which (a) the final solidification temperature and composition is variable, and (b) substantial diffusion occurs in the solid during and after solidification. In iron-26 per cent nickel alloy, segregation ratio obtained is from 1.15 to 1.28 depending on solidification conditions. These results are in qualitative agreement with theory. Dendrite morphology was examined in iron-nickel alloys containing from 10 to 26 per cent nickel, and in iron-nickel-carbon alloys containing about 26 per cent nickel and up to 0.42 per ent carbon. 'Cellular' structures result in the alloys studied under conditions of low solute content and high cooling rate. Lower cooling rates and higher solute contents produce a more complex dendrite structure, with secondary and tertiary branching. Primary dendrite arm spacing in the ingots studied ranged from about 40 to 700 microns, depending on alloy analysis and cooling rate. Dendrite arm spacing in the alloys studied generally increase with (a) decreasing cooling rate, (b) increasing nickel content (at least in the range of 15 to 26 per cent nickel, and (c) carbon additions. (Author)

**AD-624 997 Fld. 11/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**HIGH-PURITY METALS: ANNOTATED BIBLIOGRAPHY.**
Rept. no. 1 on ATD work assignment no. 79, task 21,
by Alex Zurichenko. 8 Dec 65, 30p. Rept. no. atd-65-109
TT 65-64830

Unclassified report

Based on Soviet and Soviet-Bloc open-source material, covering 1959-1963 inclusive. Rept. on Surveys of Scientific and Technical Literature.

Descriptors: (*Metals, Purification), (*Bibliographies, Metals), USSR, Zone melting, Refining (Metallurgy), Recrystallization, Crystal growth

**AD-625 028 Fld. 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*NORTH CAROLINA STATE UNIV RALEIGH DEPT OF ENGINEERING RESEARCH*
**TERNARY INTERSTITIAL COMPOUNDS OF BORON AND NITROGEN WITH TRANSITION AND POSTTRANSITION METALS.**
Final rept.,
by H. H. Stadelmaier. 15 Dec 65, 9p. Contract DA-ARO (D)-31-124-G94 Proj. DA-59901004, AROD-3138-MC AROD 3138:18

Unclassified report

Descriptors: (*Boron alloys, Phase studies), (*Phase studies, Transition elements), (*Transition metals, Phase studies), Bibliographies, Nitrogen compounds, Manganese alloys, Iron alloys, Cobalt alloys, Nickel alloys, Gallium alloys, Germanium alloys, Indium alloys, Tin alloys, Aluminum alloys, Zinc alloys, Chromium alloys, Carbon alloys, Magnesium alloys, Intermetallic compounds, Abstracts, Crystal structure

**AD-625 148 Fld. 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PROBLEM OF THE BEHAVIOR OF HEAT RESISTANT ALLOYS IN CONTACT WITH SODIUM IN STRESSED STATE,**
by G. P. Benediktova, and S. T. Kishkin. 8 Dec 65, 12p. Rept. no. ftd-TT-65-1050
TT 66-60009

Unclassified report

Unedited rough draft trans. of Aviatsionnyi Institut, Moscow. Trudy (USSR) n158 p29-34 1964.

Descriptors: (*Heat-resistant metals + alloys, Stress corrosion), (*Sodium, Corrosive liquids), USSR, Corrosion, Oxygen, Mixtures, Radiography, Surfaces

The article discusses stress corrosion of heat-resistant alloys in contact with Sodium containing admixtures.

**AD-625 154 Fld. 11/6, 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**STRUCTURAL IMPERFECTIONS OF METALS DURING RECRYSTALLIZATION,**
by S. Z. Bokshtein, S. T. Kishkin, L. M. Moroz, and V. S. Chaplygina. 26 Nov 65, 15p. Rept. no. ftd-TT-65-1090
TT 66-60015

Unclassified report

Unedited rough draft trans. of mono. Protsessy Diffuzii, Struktura i Svoistva Metallov (Diffusion Processes, Structure and Properties of Metals), Moscow, 1964 p99-108.

Descriptors: (*Metals, Crystal lattice defects), (*Recrystallization, Metals), USSR, Grain structures (Metallurgy), Iron, Diffusion, Carbon, Grain boundaries, Autoradiography, Impurities

An investigation was made of the heredity of metal structure during recrystallization and grain growth. The investigation method combined autoradiographic and microstructural analyses. The degree of perfection of separate structural zones after recrystallization was determined by their diffusion permeability, as a defective structure has a higher permeability for diffusive atoms. Diffusive saturation of specimens by a radioactive tracer was investigated by means of special donors after recrystallization. The stability or degree of imperfection of the boundaries of initial grains after recrystallization was investigated depending on the degree of purity of the material and recrystallization conditions. 'Sulim' iron, as well as iron with diffused atoms of various elements (such as tin, tungsten) at the boundaries were investigated for saturation of the boundaries of initial grains with impurities.

**AD-625 257 Fld. 11/6, 7/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV*
**DETERMINATION OF THE ALUMINA CONTENT OF ALUMINUM ALLOYS.**
Technical rept.,
by Richard B. Miclot. Nov 65, 25p. Rept. no. tr-65-2959
Proj. DA-1C014501B32A

Unclassified report

Descriptors: (*Quantitative analysis, Aluminum compounds), (*Aluminium compounds, Oxides), (*Aluminium alloys, Quantitative analysis), Determination, Iodine, Chlorine, Methanols, Foils

A method has been investigated for the quantitative determination of aluminum oxide in aluminum alloys. Iodine and chlorine were used as isolating agents for aluminum oxide in an aluminum matrix. A spectrophotometric method of aluminum analysis is presented employing these halogen reagents. Limited test results on aluminum foil and wire indicate that a high iodine concentration in methanol, when chlorine is present, yields consistent results of Al2O3 content. (Author)

**AD-625 293 Fld. 11/6, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*

**INFLUENCE OF HEAT TREATMENT ON THE PHYSICOMECHANICAL PROPERTIES OF STEELS OF THE AUSTENITE-MARTENSITE CLASS,**
by V. S. Postnikov, V. V. Usanov, and I. M. Sharshakov. 26 Nov 65, 14p. Rept. no. ftd-TT-65-1072
TT 66-60071

Unclassified report

Unedited rough draft trans. of Russian article published in Izvestiya Vysshikh Uchebnykh Zavedenii. Chernaya Metallurgiya (USSR) n11 p149-54 1964.

Descriptors: (*Steel, Heat treatment), Physical properties, USSR, Austenite, Martensite, Temperature, Internal friction, Viscosity, Resistance (Electrical), Tensile properties, Stainless steel

Data is presented on the influence of heating temperature on internal friction (viscosity), resistivity, ultimate strength and relative elongation of stainless steels of the transitional austenite-martensite class.

**AD-625 371 Fld. 11/6**
**CFSTI Prices: HC $3.00 MF $0.50**
*CARNEGIE INST OF TECH PITTSBURGH PA METALS RESEARCH LAB*
**OPTICAL PROPERTIES OF METALS AND ALLOYS.**
Final rept.,
by W. R. Bitler. 4 Aug 65, 56p. Contract AF49 (638)-478 Proj. AF-9763 Task 976302
AFOSR 65-1843

Unclassified report

Descriptors: (*Copper, Optical properties), (*Nickel, Optical properties), (*Alloys, Optical properties), Electron microscopy, Electron diffraction, Fluorescence, Metal films, Light transmission, Differential equations, Copper alloys, Nickel alloys

The object of this investigation was to determine the optical absorption coefficients of copper, nickel, and a series of copper-nickel alloys. Technical difficulties were encountered in analyzing the samples for thickness and composition by the x-ray fluorescence method. These difficulties were resolved by the following changes in procedure: flash evaporation permitting the evaporation of previously prepared alloys of known composition, epitaxial deposition on halide substrates, and subsequent examination by electron diffraction and transmission microscopy. Three separate papers giving detailed descriptions of the work are attached. (Author)

**AD-625 374 Fld. 11/6, 13/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*NAVAL RESEARCH LAB WASHINGTON D C*
**METALLURGICAL CHARACTERISTICS OF HIGH STRENGTH STRUCTURAL MATERIALS.**
Quarterly rept. no. 8, May-Jul 65,
by P. P. Puzak, K. B. Lloyd, R. J. Goode, R. W. Huber, and D. G. Howe. Aug 65, 99p. Rept. no. nrl-6364
Proj. SP-01426 ,RR-007-01-46-5405

Unclassified report

See also AD-621 567.

Descriptors: (*Submarine hulls, Metal plates), (*Titanium alloys, Fracture (Mechanics)), (*Aluminum alloys, Fracture (Mechanics)), (*Steel, Fracture (Mechanics)), Toughness, Maraging steels, Nickel alloys, Vanadium alloys, Chromium alloys, Molybdenum alloys, Welds, Corrosion, Fatigue (Mechanics), Heat treatment, Tests, Mechanical properties

A progress report covering research studies in high strength structural materials conducted in the period May 1965 to July 1965 is presented. The report includes fracture toughness studies on the 12% Ni maraging and 9Ni-4Co-.XXC steels, a variety of titanium alloy MIG, EB, and plasmarc weldments, and some aluminum alloys. The current fracture toughness index diagrams are presented for steels, titanium alloys, and aluminum alloys. Results are presented of (1) a study of the planestrain fracture toughness of the alloys Ti-6Al-4V and Ti-6Al-6V-2.5Sn over respective yield strength ranges of 130-140 ksi and 147-186 ksi; (2) heat-treatment studies on several titanium alloys; and (3) a low cycle fatigue crack propagation study of 5Ni-Cr-Mo-V steel in dry and wet environments in which considerable microcrack formation and growth was encountered. (Author)

**AD-625 454 Fld. 11/6, 1/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*ALCOA RESEARCH LABS ALUMINUM CO OF AMERICA NEW KENSINGTON PA*
**FRACTURE TOUGHNESS, FATIGUE-CRACK PROPAGATION AND CORROSION CHARACTERISTICS OF ALUMINUM ALLOY PLATES FOR WING SKINS.**
Quarterly rept. 3, Sep-3 Dec 65,
by G. E. Nordmark, B. W. Lifka, and J. G. Kaufman. 15 Dec 65, 43p. Contract AF33 (615)-2012

Unclassified report

See also AD-447 683.

Descriptors: (*Aluminum alloys, Fracture (Mechanics)), (*Metal plates, Aluminum alloys), Toughness, Fatigue (Mechanics), Corrosion, Corrosion resistant alloys, Airplane panels, Wings, Tables, Stresses, Stress corrosion, Bolted joints, Tensile properties, Environmental tests

The fracture toughness, fatigue properties and corrosion resistance of 2020-T651, 2024-T851, 2219-T851 and 7001-T75 are being determined. Fracture-toughness tests of 1-in. specimens of the 2020-T651, 2219-T851 and 7001-T75 were completed during the past quarter. The fracture toughness of 2020-T651 is lowest; those of 7001-T75 and 2024-T851 are higher but still about 20 per cent below that of 7075-T651 (from AF33 (657)-11155). The fracture toughness of 2219-T851 is exceptionally high, equalling or exceeding that of 7075-T7351. Fatigue tests of center-notched specimens of 2020-T651 and 2219-T851 are complete. Cracks initiate in about the same number of cycles for 2219-T851 as for 2024-T851, and slightly sooner than in 2020-T651 and 7075-T651. Cracks propagate more slowly in 2219-T851 and 2020T651 than in some of the other alloys, but 2020-T651 fails at shorter crack lengths. Corrosion tests show that 2020-T651, 2024-T851 and 2219-T851 are highly resistant to exfoliation attack and to stress-corrosion cracking in any direction at stresses up to 75 per cent of the yield strength, similar to the case for 7075-T7351. (Author)

**AD-625 475 Fld. 11/6, 18/8, 18/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*COMISION NACIONAL DE ENERGIA ATOMICA BUENOS AIRES (ARGENTINA) DEPARTAMENTO DE METALURGIA*
**POINT DEFECTS AND MECHANICAL PROPERTIES OF COLUMBIUM.**
Final rept. 15 Feb 62-30 Nov 65,
by Jorge A. Coll, Juan C. Di Primio, and Edgardo Bisogni. Nov 65, 39p. Contract DA-ARO-49-092-63-G20 ,DA-ARO-49-092-64-G44 Proj. DA-20014501B32D-00-003-LA

Unclassified report

Descriptors: (*Niobium, Radiation damage), (*Radiation damage, Niobium), Argentina, High-temperature research, Reactor materials, Hardness, Quenching (Cooling), Impurities, Crystal lattice defects, Deformation, Resistance (Electrical), Mechanical properties, Experimental data

The results of two and a half years of experimental work are presented in the form of conclusions, five tables and nine graphs. Also included are photographs and diagrams of the experimental set up. Results of R vs T for Cb show agreement with others up to 1000C results can be expressed by RsubT = R(OC) (1-aT-bT) squared) which differs from linear relationship obtained elsewhere. Because of quenching some kind of defects can be retained in Cb containing certain amount of interstitial impurities. A minimum dose of 1.10 to the 17th power neutrons/sq cm is necessary to produce a measurable increase in the hardness of polycrystalline Cb. (Author)

**AD-625 532 Fld. 11/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL APPLIED SCIENCE LAB BROOKLYN N Y*
**STRESS CRACKING PROPERTIES OF TI-721 ALLOY TITANIUM LARGE SCALE BUTT WELDED AND BASE PLATE SPECIMENS IN AIR AND SEA WATER.**
Progress rept.,
by H. V. Cordiano. 7 Dec 65, 38p. Rept. no. 6377-5 ,PR-1
Proj. SF-020-01-01 Task 0723

Unclassified report

Descriptors: (*Titanium alloys, Fracture (Mechanics)), (*Fracture (Mechanics), Titanium alloys), Stresses, Environmental tests, Sea water, Air, Bending, Welds, Stress relieving, Metal plates

Stress cracking properties of Ti-721 alloy titanium in air and sea water have been determined. A butt welded 1 in. thick plate without cracks fractured completely in 17 minutes in sea water under a transverse bending stress of 80,000 psi. A similar pre-cracked butt welded specimen under the same loading conditions in air required approximately 70 hours for complete fracture. Stress relieving the butt weld prior to testing did not improve resistance to stress cracking in sea water. Stress relieving reduced transverse and longitudinal residual stresses at the toe of the weld from approximately 88,000 and 93,000 psi, respectively, in the aswelded condition to approximately 6,000 and 33,000 psi, respectively, in the stress relieved condition. The critical stress intensity factor, K sub I-scc, as determined from pre-cracked cantilever loaded specimens, was found to be 61 ksi square root of (in.) in sea water and -78 ksi square root of (in) in air. (Author)

**AD-625 554 Fld. 11/6**
*WISCONSIN UNIV MADISON*
**MECHANISMS OF TRANSGRANULAR STRESS CORROSION CRACKING OF SOLID SOLUTION ALLOYS,**
by N. Ohtani, and R. A. Dodd. 13 Apr 64, 12p.
Contract AF-AFOSR-221-63 Proj. AF-9763 Task 976301
AFOSR 65-1903

Unclassified report

*Availability: Published in Corrosion v21 n5 p161-72 May 1965. Copies to DDC users only.*

Descriptors: (*Copper alloys, Stress corrosion), (*Silver alloys, Stress corrosion), (*Stainless steel, Stress corrosion), (*Stress corrosion, Fracture (Mechanics), Solid solutions, Platinum alloys, Palladium alloys, Electrolysis, Austenite, Crystal lattice defects

Effects of structure and electrochemical properties on transgranular stress corrosion susceptibility of various copper and silver alloys and austenitic stainless steels have been examined. Results suggest that the alloys be classified in three groups according to their postulated mode of failure: Those of the (base solvent) (noble solute) type, e.g., Cu (Au), Cu (Pt), Cu (Pd), etc., single crystals of which are generally very susceptible to stress corrosion cracking, probably on account of solute diffusion to dislocations and the accompanying local galvanic corrosion. Those of the (base solvent) (base solute) type, e.g., Cu (Zn), etc., which are not very susceptible to stress corrosion crack-

ing when in single crystal form and in the particular environments studied; transgranular cracking in polycrystals is believed to be mechanical in nature. Austenitic stainless steels, transgranular stress corrosion susceptibility of which may be due to nucleation of signa phase at stacking faults, or to formation of passive surface films, or to a combination of both effects; thus, unlike (1) and (2) above, the stress corrosion behavior of these alloys may depend on stacking fault energy. (Author)

**AD-624 877** See Fld. 20/2

**AD-624 909** See Fld. 13/8

**AD-625 023** See Fld. 20/2

**AD-625 069** See Fld. 13/8

**AD-625 145** See Fld. 13/8

**AD-625 161** See Fld. 13/8

**AD-625 198** See Fld. 10/1

**AD-625 290** See Fld. 21/5

**AD-625 340** See Fld. 5/1

**AD-625 370** See Fld. 9/5

**AD-625 428** See Fld. 20/12

**AD-625 579** See Fld. 20/13

**AD-625 606** See Fld. 14/2

## 11/8. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

**AD-625 000 Fld. 11/8, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF OBTAINING LUBRICANT FOR HOT WORKING OF METALS,**
by Z. M. Kalinkina, and G. A. Evsyukova. 21 Oct 65, 6p. Rept. no. ftd-TT-65-794
TT 65-64831

Unclassified report

Unedited rough draft trans. of Patent (USSR) 165 861, pub. 12 Feb 62, appl. no. 764580/23-5.

Descriptors: (*Hot working, Lubricants), (*Lubricants, Hot working), USSR, Patents, Glass, Graphite, Oxides, Silicon compounds, Boron compounds, Potassium compounds, Sodium compounds, Iron compounds, Colloids

The object of the invention is a method for obtaining lubricant for hot working of metals by means of a mixture of emulsion, graphite, and glass. For the purpose of increasing the interval of softening and the heat resistance of the lubricant one uses glass consisting of 13.8 to 14 percent of silicon oxide, 10 to 10.12 percent of boron oxide, 49 to 49.2 percent of potassium oxide, 17.78 to 18 percent of sodium oxide, and 9 to 9.1 of iron oxide. (Author)

**AD-625 053 Fld. 11/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ANTIWEAR ADDITIVE FOR LUBRICATING OILS,**
by L. M. Kogan, A. M. Pavikovich, Yu. N. Bezobrazovand , and N. M. Burmakin. 21 Oct 65, 6p. Rept. no. ftd-TT-65-795
TT 65-64837

Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 436, Appl. no. 776560/23-5, 29 Apr 62.

Descriptors: (*Lubricant additives, Wear resistance), (*Wear resistance, Lubricant additives), USSR, Patents, Lubricants, Halogenated hydrocarbons

The object of the invention is the application of hexachlorcyclopentadiene
as an antiwear additive to lubricating oils. (Author)

**AD-625 136 Fld. 11/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV*
**RHEOLOGICAL PROPERTIES OF GREASES OVER WIDE TEMPERATURE RANGES.**
Technical rept.,
by Robert L. Young. Oct 65, 33p. Rept. no. tr-65-2812
Proj. DA-1C024401A107

Unclassified report

Descriptors: (*Greases, Rheology), Lubrication, Viscosity, Temperature, Stability, Stresses, Transition temperature, Friction, Wear resistance, Penetration, Performance (Engineering), Lubricants

Routine physical characteristics were determined for ten lubricating greases of varying types. The roll stability test for lubricating grease, ASTM D1831-64, was performed on each grease at eleven temperatures ranging from -65 F to 250 F and for extended periods of time. The apparent viscosity, ASTM D1092-62, was determined for each grease at the same temperatures. Curves were constructed from the roll stability, apparent viscosity and yield stress data. A departure from the general trend of the slope of these curves was taken as a possible phase change or transition temperature. The wear preventive characteristics of lubricating grease, ASTM D2266-64T were determined for two greases that gave indications of having definite phase changes. Wear tests were made over the working range of temperatures for each grease. The results did not show any noticeable change in lubricity of the grease occasioned by the indicated phase change. (Author)

**AD-625 155 Fld. 11/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**DETERMINING THE ELASTICITY OF SATURATED VAPORS OF LUBRICATING MATERIALS,**
by V. M. Martynov, and M. V. Morozova. 3 Dec 65, 16p. Rept. no. ftd-TT-65-1063
TT 66-60016

Unclassified report

Unedited rough draft trans. of Khimiya i Tekhnologiya Topliv i Masel (USSR) v8 n12 p62-5 1963.

Descriptors: (*Lubricants, Vapors), (*Vapors, Elasticity), USSR, Vacuum, Determination

On the basis of experimental data, obtained during the study of elasticity of saturated oil and grease vapors, it can be concluded, that, if the oil or grease are designated for use within a period of long time in vacuum conditions, when the vapors of evaporating components do not effect the operation of the mechanisms, evaluation of the working period of the given lubricant will be insufficient by the value of the initial vapor elasticity. The initial vapor elasticity depends upon the admixture of light components, the removal of which sharply reduces vapor elasticity.

**AD-625 160 Fld. 11/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF OBTAINING LUBRICANT FOR TITANIUM PARTS,**
by N. K. Sulzhenko, and V. P. Barannik. 15 Dec 65, 5p. Rept. no. ftd-TT-65-1193
TT 66-60021

Unclassified report

Unedited rough draft trans. of Russian Patent 166 081, pub. 7 Feb 63, appl. no. 819801/23-4.

Descriptors: (*Lubricants, Titanium), (*Titanium, Lubrication), Iodides, Preparation, USSR, Patents, Corrosion inhibition, Oleic acids

The object of the invention is a method of obtaining a lubricant for titanium parts on the basis of crystalline iodide for preventing the seizing of fastened titanium parts and improving anticorrosion capacity. Oleic acid is subjected to interaction with crystalline iodine at a temperature of 85 degrees in the ratio of 1:1. (Author)

**AD-625 204 Fld. 11/8, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*DOW CHEMICAL CO MIDLAND MICH SCIENTIFIC PROJECTS LAB*
**SYNTHESIS AND EVALUATION OF NEW FIRE RESISTANT HYDRAULIC FLUIDS.**
Bimonthly rept. no. 4, 15 Oct-15 Dec 65,
by C. D. Burton, and N. L. Madison. 15 Dec 65, 19p. Contract NObs-92264

Unclassified report

Descriptors: (*Fire-resistant materials, Hydraulic fluids), (*Hydraulic fluids, Synthesis (Chemistry)), (*Halogenated hydrocarbons, Hydraulic fluids), Fluorine compounds, Chlorine compounds, Ethers, Esters, Physical properties, Autoignition, Tests, Purification

Preliminary testing of the compounds CH3OC (CF2Cl) 2O (CH2)6OC (CF2Cl)2OCH3, FC (CF3)2O (CH2)6OC (CF3)2F, and CH3OC (CF2Cl)2O (CH2)2O (CH2)2O (CH2)2OC (CF2Cl) 2OCH3 was completed. The new halogenated ether, CH3OC (CF2C1)2O (CH2)2O (CH2)2O (CH2)2OC (CF2C1) 2OCH3, Compound D, was synthesized and tested. Another new polyether, FC (CF3)2O (CH2)2OC (CF3)2O (CH2)2OC (CF3) 2OCH3, Compound E was synthesized and the preliminary tests, except flash and fire points, were completed. A halogenated ester, FC (CF2Cl)2OC=O (CH2)4C=OOC (CF2Cl) 2F, Compound F, was synthesized but not tested due to its instability. The compounds, (CF2Cl)2FCO (CH2)6OC (CF2Cl) 2F and (CF2Cl)2FCO (CH2)2O (CH2)2O (CH2)2OC (CF2Cl)2F, were synthesized, but they have not, as yet, been isolated in a pure state. (Author)

**AD-625 485 Fld. 11/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*SOUTHWEST RESEARCH INST SAN ANTONIO TEX*
**LUBRICATION RESEARCH FOR AERO PROPULSION SYSTEMS.**
Phase rept. no. 1, 1 Feb-1 Sep 65,
by E. L. Anderson, B. B. Baber, and P. M. Ku. Oct 65, 42p. Contract AF33 (615)-2384 Proj. AF-3044 Task 304401
APL TR-65-118

Unclassified report

Rept. on Bearing Support Deposits Program.

Descriptors: (*Airplane engine oils, Solvent action), (*Solvents, Carbon), (*Carbon, Solvents), Bearings, Supports, Deposition, Chemical milling, Cleaning

Investigations were conducted to determine the possible effect of selected aircraft gas turbine engine lubricants and various solvents on the removal of carbonaceous deposits which had accumulated during service on the No. 2 bearing rear support of the J-57 engine. Six MIL-L-7808 type and one MIL-L-23699 type lubricants and six solvents were included in this program. Under the test procedures used, the deposits on the bearing support specimens were found to be quite stable in the presence of all seven lubricants investigated; no loo-

sening or sloughing of the deposits was observed. Of the six solvents evaluated, only Cities Service 26 was found to be effective in removing significant amounts of deposits from the specimen. Flashing of liquid water, which had penetrated the deposit covered surface, loosened crinkled, blistered, and flaked deposits but had no effect on smooth carbon or varnish. (Author)

**AD-624 910 See Fld. 21/7**

**AD-625 092 See Fld. 11/9**

**AD-625 286 See Fld. 11/9**

## 11/9. PLASTICS

**AD-624 922 Fld. 11/9**
**CFSTI Prices: HC $5.00 MF $1.00**
*PLASTICS TECHNICAL EVALUATION CENTER PICATINNY ARSENAL DOVER NJ*
**ELECTRICAL PROPERTIES OF PLASTIC MATERIALS: DATA COMPILED FROM TECHNICAL CONFERENCE SEARCH.**
Selected data rept.,
by Arnold E. Molzen. Jul 65, 154p. Rept. no. plastec-23

Unclassified report

Descriptors: (*Plastics, Electrical properties), Experimental data, Acrylic resins, Phenolic plastics, Epoxy plastics, Halocarbon plastics, Polyamide plastics, Polyester plastics, Polyethylene plastics, Styrene plastics, Isocyanate plastics, Silicone plastics, Amino plastics, Vinyl plastics, Aging (Materials), Indexes, Subject indexing

This report presents data on the electrical properties of plastic materials. It was compiled from the pertinent reports among the approximately 1600 papers which were presented at 49 technical conferences over the period from March 1960 to March 1965. Data is presented on: acrylate-ethylene copolymers; acrylics; alkyd; allylic; butadiene-styrene copolymer; diphenyl oxide; epoxy; ethylene-vinyl acetate copolymer; fluorocarbon; ionomer; melamine; phenolic; polyamide; polycarbonate; polyester; polyether; polyethylene; polyimide; polyphenylene oxide; polypropylene; polystyrene; polyurethane; silicone; urea formaldehyde; and the vinyls. Included are: a subject index, a list of company material designations, a list of references, the identification of the technical conferences from which the information was gathered, and a list of trade names which appear in (and are inseparable from the information presented in) this report. (Author)

**AD-624 977 Fld. 11/9, 7/3**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY*
**TACTICITY DETERMINATIONS ON ALLYL METHACRYLATE POLYMERS.**
Revised ed.,
by D. M. Wiles, and S. Brownstein. 20 Aug 65, 5p. NRC 8718

Unclassified report

Revision of manuscript submitted 23 Jun 65.

*Availability: Published in Journal of Polymer Science V3 N11 PTB P951-4 Nov 1965. Copies to DDC users only.*

Descriptors: (*Acrylic resins, Stereochemistry), (*Stereochemistry, Acrylic resins), Nuclear magnetic resonance, Absorption spectrum, Viscosity, Molecular weight, Canada

High resolution proton magnetic resonance techniques were employed to study the stereoregularity in several polylallylmethacrylate samples. Peaks at 1.38 ppm, 1.23ppm, and 1.15ppm were established for the isotactic, heterotatic, and syndiotactic methyl groups respectively. Consideration is given to the solvent dependence of tacticity.

**AD-625 092 Fld. 11/9, 7/1, 13/9, 11/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**NEW ANTIFRICTION AND CHEMICALLY STABLE MATERIALS,**
by S. N. Ganz, and V. B. Parkhomenko. 1 Dec 65, 15p. Rept. no. FTD-TT-65-857
TT 65-64863

Unclassified report

Unedited rough draft trans. of Khimichna Promyslovist (USSR) n4 p20-4 1963.

Descriptors: (*Lubrication, Halocarbon plastics), (*Halocarbon plastics, Additives), (*Industrial equipment, Materials), USSR, Piston rings, Antifriction bearings, Molybdenum compounds, Sulfides, Boron compounds, Nitrides, Barium compounds, Sulfates, Graphite, Carbon, Aluminum compounds, Oxides, Adhesives, Friction

A description is given of new types of antifriction and chemically stable materials, manufactured on the basis of fluoroplast-4 (a polytetrafluoroethylene)
, where molybdenum disulfide, boron nitride, barium sulfuric acid, colloidal graphite type S-1, ground coke, pure anhydrous alumimum oxide and gas channel soot ware used as fillers. These materials can be use in role of self-greasing piston rings, slide bearings, packing elements, etc. Their application will offer the possibility of replacing stainless steel, pure aluminum, antichlor and other deficit and high cost materials in chemical apparatus and machine construction. (Author)

**AD-625 168 Fld. 11/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PRODUCTION PROCESS FOR FOAM PLASTICS,**
by V. D. Valgin, V. N. Demin, and E. B. Petrilenkova. 15 Dec 65, 9p. Rept. no. ftd-TT-65-1247
TT 66-60025

Unclassified report

Unedited rough draft trans. of Russian Patent 167 033, pub. 30 Jan 63, appl. no. 816862/23-4.

Descriptors: (*Expanded plastics, Manufacturing methods, USSR, Patents, Polyester plastics, Isocyanates plastics, Catalysts, Acrylic resins, Production

The object of the invention is a method of obtaining a foam plastic on the basis of unsaturated polyestermaleate resins, siisocyanates, water, a catalyst, and an emulsifier, by mixing the original components with subsequent foaming and hardening of the composition. To increase the stability of the foam and improve the sanitary conditions of the work, unsaturated polyestermaleate resins are used in the form of solutions of them in nonvolatile di- and polyester-acrylates. Unsaturated polyester maleates that contain chlorine may be used to give the foam plastic the properties of self-attenuation. (Author)

**AD-625 174 Fld. 11/9, 7/3**
*SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY*
**A POLYSACCHARIDE GRAFT COPOLYMER PREPARED BY ANIONIC COUPLING,**
by James J. O'Malley, and R. H. Marchessault. 29 Apr 65, 5p. AROD 4625 1

Unclassified report

*Availability: Published in Polymer Letters v3 p685-9 1965. Copies to DDC users only.*

Descriptors: (*Polysaccharides, Copolymerization), (*Styrene plastics, Copolymerization), Esters, Polymers, Molecular weight, Cellulose, Uronic acids

A description is given of an adaptation of an established technique involving the coupling of 'living' polystyrene to ester groupings on a polymer substrate. A wood polysaccharide, 4-O-methyl glucuronoxylan, was employed as the substrate. The anonic grafting process apparently allows the preparation of well defined graft copolymers of polysaccharides containing ester uronates provided the hydroxyl functions are inactivated.

**AD-625 286 Fld. 11/9, 11/8, 11/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**STUDYING THE EFFECT OF ADDITIONS TO POLYCAPROLACTAM 'B' ON ANTIFRICTION PROPERTIES AND ADHESION TO METAL,**
by D. S. Makhmudov, and A. N. Levin. 15 Nov 65, 14p. Rept. no. ftd-TT-65-986
TT 66-60064

Unclassified report

Unedited rough draft trans. of Institut Khimicheskogo Mashinostroeniya. Trudy (USSR) v27 p194-200 1964.

Descriptors: (*Nylon coatings, Additives), Lubricants, Friction, Inhibition, Adhesion, Wear resistance, Powder metals, Aluminum, Talc, Molybdenum compounds, Sulfides, USSR

It is shown that the addition to polycaprolactum of aluminum powder, talcum, graphite and, in particular, molybdenum disulfide improves its antifriction properties and certain other physio-mechanical qualities.

**AD-625 304 Fld. 11/9, 13/9**
**CFSTI Prices: HC $3.00 MF $0.75**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**STUDY OF FRICTION OF POLYAMIDES ON STEEL,**
by V. P. Mitrovich. 30 Nov 65, 90p. Rept. no. ftd-TT-64-1092
TT 66-60081

Unclassified report

Unedited rough draft trans. of mono. Issledovanie Treniya Poliamidov po Stali, Moscow, 1963 95p.

Descriptors: (*Polyamide plastics, Friction), (*Bearings, Polyamide plastics, USSR, Steel, Lubrication, Wear resistance, Nylon, Bushings, Temperature, Antifriction bearings

The object of the work was to investigate the friction of polyamides on steel as it relates to the operating conditions of bearing materials, and to find the basic factors on which the value of their friction depends.

**AD-625 329 Fld. 11/9, 20/11, 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY*
**THE VISCOELASTIC RELAXATION MECHANISM OF INORGANIC POLYMERS. IV. SIMULTANEOUS MULTIPLE MECHANISMS.**
Technical rept.,
by A. Eisenberg, S. Saito, and L. A. Teter. 15 Dec 65, 27p. Rept. no. tr-8
Contract Nonr-233 (87) Proj. NR-051-453

Unclassified report

This is a rewritten version of rept. no. 8 submitted 10 Jul 65. See also AD-608 896.

Descriptors: (*Inorganic polymers, Viscoelasticity), (*Viscoelasticity, Relaxation time), (*Phosphates, Inorganic polymers), (*Sulfur, Inorganic polymers), Phase studies, Diffusion, Chemical bonds, Sodium compounds, Impurities, Doping, Lanthanum, Arsenic, Heat of activation, Viscosity, Thermal properties, Stresses

The viscoelastic properties of two polymers were studied in which both molecular (diffusional) motions and bond interchange were present in the glass transition region. The materials were a lanthanum (La (+3)) doped sodium polyphosphate and an arsenic doped sulfur polymer. It is shown that (just as in the case of the acrylate polymers studied by Ferry) the two mechanisms have two different compliance curves associated with them which move with bond interchange and the other to the diffusional motion of the chains. On the basis of activation energy arguments the compliance curves are matched with the mechanisms, and the relative contributions to the total viscosity due to each mechanism are given as a function of temperature. (Author)

**AD-625 330 Fld. 11/9, 7/4, 20/12**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY*
**GLASS TRANSITIONS IN IONIC POLYMERS.**
Technical rept.,
by A. Eisenberg, H. Farb, and L. G. Cool. 20 Nov 65, 25p. Rept. no. tr-10
Contract Nonr-233 (87) Proj. NR-051-453
Unclassified report

Descriptors: (*Inorganic polymers, Phase studies), (*Electrolytes, Inorganic polymers), (*Phosphates, Inorganic polymers), Glass, Ions, Electrostatics, Molecular structure, Copolymerization, Transition temperature, Lithium compounds, Sodium compounds, Calcium compounds, Strontium compounds, Barium compounds, Zinc compounds, Cadmium compounds

The glass transition temperatures of an inorganic anionic phosphate polymer system was studied over a wide range of counterions. It was shown that the glass transition temperature could be varied between -10C to + 520C, and that a plot of the glass Transition Temperature versus the ratio of the cation change (g) to internuclear distance between the cation and the oxygen on the polymer backbone ('a') yielded a straight line over the entire temperature range; a theoretical justification for this linearity was presented. It was further shown that the increase in the glass transition with (g/a) is due not only to an increase in the interchain forces, but also to an increase in the carrier to internal rotation between neighboring groups. (Author)

**AD-625 331 Fld. 11/9, 20/11, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY*
**VISCOELASTIC RELAXATION MECHANISMS OF INORGANIC POLYMERS. V. COUNTERION EFFECTS IN BULK POLYELECTROLYTES.**
Technical rept.,
by A. Eisenberg, S. Saito, and T. Sasada. Dec 65, 25p. Rept. no. tr-11
Contract Nonr-233 (87) Proj. NR-051-453
Unclassified report

Prepared for presentation before the A.C.S. West Coast Regional Meeting, 1965. See also AD-625 329.

Descriptors: (*Inorganic polymers, Viscoelasticity), (*Viscoelasticity, Relaxation time), (*Electrolytes, Inorganic polymers), (*Phosphates, Inorganic polymers), Ions, Electrostatics, Molecular weight, Chemical bonds, Potassium compounds, Sodium compounds, Calcium compounds, Lanthanum compounds

The viscoelastic properties of an inorganic anionic polyphosphate were studied as a function of the counterion. It is shown that as the counterion strength (as expressed, for instance by the ratio of charge to internuclear distance between cation and oxygen anion) increases, the distribution of relaxation times narrows in an approximately linear manner. A small effect of the molecular weight is also observed on the narrowing of the relaxation spectrum, but the latter is much smaller than the former. (Author)

**AD-625 541 Fld. 11/9, 7/3**
*FRICK CHEMICAL LAB PRINCETON UNIV N J*
**IONIC COPOLYMERIZATION OF STYRENE AND P-METHYL-STYRENE.**
Revised ed.,
by B. D. Phillips, T. L. Hanlon, and A. V. Tobolsky. 26 Dec 63, 15p. Contract AF-AFOSR-157-63 AFOSR 65-2198
Unclassified report

Revision of manuscript submitted 29 Oct 63.

*Availability: Published in Journal of Polymer Science: ptA v2 p4231-45 1964. Copies to DDC users only.*

Descriptors: (*Styrenes, Copolymerization), (*Styrene plastics, Preparation), (*Copolymerization, Catalysts), (*Catalysts, Copolymerization), Catalysis, Ions, Effectiveness, Friedel-Crafts reactions Peroxides, Aluminum compounds, Metalorganic compounds, Alkali metal compounds, Complex compounds, Solvents

The copolymerization of styrene and p-methylstyrene was initiated by Friedel-Crafts metal halides, benzoyl peroxide, a Ziegler catalyst from triethylaluminum and titanium tetrachloride, alkali metal dispersions, and alkali metal-naphthalene complexes in a variety of polar and nonpolar solvents. The composition of the initial copolymer from an equimolar monomer mixture was used as the basis for comparison of these systems. By a suitable choice of initiator and solvent, the copolymer composition was varied within the range 25-79 wt.-% styrene. Cationic catalysts yield copolymers with low styrene contents while anionic and electron transfer initiators produce copolymers with high styrene contents. The compositions of the initial copolymers are briefly discussed in relation to the ionic character of the growing polymer-gegenion ion pair and the polarity of the reaction medium. (Author)

**AD-625 613 Fld. 11/9, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**REACTIONS OF CHLOROMETHYLSILANES AND SILOXANE WITH DEHYDRIC PHENOLS,**
by K. A. Andrianov, V. I. Pakhomov, and N. E. Lapteva. 1965, 6p. Rept. no. translation-2043 TT 66-60102
Unclassified report

Trans. of Plasticheskie Massy (USSR) v9 p20-2 1965.

Descriptors: (*Silicone plastics, Preparation), (*Silanes, Cehmical reactions), (*Siloxanes, Chemical reactions), (*Phenols, Chemical reactions), Chlorine compounds, Resorcinol, Quinones, Polymerization, Exchange reactions, Condensation reactions, Hydrolysis, Esters, USSR

The reaction of bis (chlormethyl) tetramethyl disiloxane and chlormethyl-dimethyl butoxysilane with resorcinol, hydroquinone or dioxydiphenyl propane (dian) was carried out in a medium of absolute butanol under nitrogen. Owing to the easy exchange of sodium between the monosodium derivative of resorcinol and the product, a mixture of oligomers was obtained - low molecular oxyphenoxymethylsiloxanes of the type HOAr/OCH2 (CH3) 2SiOSi (CH3)2CH2OAR/nOH, where n=2 - 3. Similarly, the reaction of bis (chlormethyl) tetramethyldisiloxane with monodisodium derivatives of hydroquinon and resorcinol took place. In the interaction of disodium derivatives of dian with chlormethyl-butoxysilane, the resin obtained was similar to disubstituted ester of the formula C29H48O4Si2 with an admixture of monosubstituted ester with the formula C22H32O3Si. Using the example of disubstituted esters of dian, the homocondensation of products of their hydrolysis with 18% HC1 was studied.

**AD-624 896 See Fld. 11/3**

**AD-624 969 See Fld. 7/4**

**AD-625 030 See Fld. 11/5**

**AD-625 524 See Fld. 7/4**

**AD-625 579 See Fld. 20/13**

## 11/10. RUBBERS

**AD-624 867 Fld. 11/10, 7/3**
**CFSTI Prices: HC $3.00 MF $0.50**
*FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY*
**RESEARCH ON SYNTHESIS OF UNSATURATED FLUOROCARBON COMPOUNDS.**
Semi-annual rept. no. 5, 1 Apr-30 Sep 65,
by Paul Tarrant, Doug Perry, Jai Tandon, Alan Wright, and Susumu Misaki. 30 Sep 65, 55p.
Contract DA-19-129-AMC-79 (N)
Unclassified report

See also AD-461 030.

Descriptors: (*Elastomers, Preparation), (*Halocarbon plastics, Preparation), (*Halogenated hydrocarbons, Synthesis (Chemistry)), (*Fluorine compounds, Alkenes), Chlorine compounds, Bromine compounds, Iodine compounds, Propenes, Ethers, Catalysis, Nitrogen compounds, Esters, Aromatic compounds

The purpose of the project is to conduct the necessary research for the preparation of unsaturated organic compounds containing fluorine and to prepare various fluorolefins which may give elastomers which are oil and fuel resistant and which retain their elasticity at low temperatures. The preparation of perfluoroallyl chloride was improved and this compound was treated with various alkoxide ions to product saturated and unsaturated ethers. Lewis acid catalysed additions of polyhaloalkanes to haloolefins were continued. In an attempt to prepare fluoronitroso compounds carrying other functional groups, nitrosyl chloride was allowed to react with unsaturated fluoroesters and ethers. The investigation of the radical addition of haloalkyl chlorides and bromides with various olefins was continued. Attempts were made to react radicals from CF2BrCFClBr and CF2ClCFCl1 with aromatic nuclei. (Author)

**AD-624 891 Fld. 11/10, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV*
**SYNTHESIS OF AMINOQUINONE POLYMERS.**
Technical rept.,
by Ronald R. Freeman. Aug 65, 18p. Rept. no. tr-65-1904
Proj. DA-1CO14501B13A
Unclassified report

Descriptors: (*Heat-resistant materials, Elastomers), (*Elastomers, Preparation), (*Quinones, Polymerization), Amines, Synthesis (Chemistry), Solubility, Differential thermal analysis, Thermogravimetric analysis, Polymers, Thermal properties, Stability, Decomposition

Aminoquinone polymers of low molecular weight were synthesized from aliphatic, aromatic and disiloxane diamines with p-benzoquinones and 1,4 napthoquinones utilizing various polymerization techniques. No polymers could be formed from diamines and anthraquinones. The polymers were

non-melting powders that were insoluble in conventional solvents but were generally soluble in formic and acetic acids, sulfuric acid and/or dimethylsulfoxide. The thermal stability of these polymers was only fair as DTA and TGA analyses indicated initial decomposition in the 250-325C range. In an oxygen flame, the polymers were reduced to ashes.

**AD-625 054 Fld. 11/10, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**REACTION OF ORGANOCYCLOSILAZANE WITH DIHYDROXY POLYORGANOSILOXANES,**
by V. B. Losev, and E. I. Minsker. 17 Nov 65, 5p. Rept. no. ftd-TT-65-722
TT 65-64838
Unclassified report

Unedited rough draft trans. of Zhurnal Obshchei Khimii (USSR) v35 n2 p396-7 1965.

Descriptors: (*Siloxanes, Chemical reactions), (*Elastomers, Synthesis (Chemistry)), Heterocyclic compounds, Polymerization, N-heterocyclic compounds, USSR

Organocyclosilazane was reacted with dihydroxy polyorganosiloxanes (dihydroxy dimethyl diohenyl disiloxane or dihydroxy trimethyl triphenyl trisiloxane) in the presence of hexamethyl cyclotrisilazane. The yield of the low molecular-weight rubberlike product amounted to about 60%. It was established that the interaction of hexamethyl cyclotrisilazane with dihydroxy polyorganosiloxanes leads to the full breakdown of silazane ring with, the formation of polymers (with regular alternation of the links in the chain) and ammonia. (Extracted)

**AD-625 055 Fld. 11/10, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**TRANSFORMATION OF RUBBER,**
by B. Dolgopiosk. 17 Dec 65, 10p. Rept. no. ftd-TT-65-1331
TT 65-64839
Unclassified report

Unedited rough draft trans. of Izvestiya (USSR) 17 Nov p7 1964.

Descriptors: Synthetic rubber, Transformations), (*Synthesis (Chemistry), Synthetic rubber), USSR, Polymerization, Rubber, Elastomers

The report discusses the ways in which the problem of the synthesis of rubber is developing.

## 11/11. SOLVENTS, CLEANERS AND ABRASIVES

**AD-625 344 Fld. 11/11, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**TRANSFER OF AIR THROUGH ADSORBED SURFACE FILMS AS A FACTOR IN FOAM STABILITY.**
Technical rept.,
by A. G. Brown, W. C. Thuman, and J. W. McBain. Oct 49, 22p. Rept. no. tr-5
Contract N7onr-321 (02) Proj. SRI-120
Unclassified report

Rept. on The Physical Chemistry and Stability of Bubbles with Special Reference to Aqueous Solutions.

Descriptors: (*Foams, Stability), (*Cleaning compounds, Foams), (*Bubbles, Permeability), Surface-active substances, Films, Adsorption, Solutions, Viscosity, Surface tension, Volume

A method was developed for the direct determination of the rate with which single bubbles, floating at the surface of detergent solutions, lose air to the atmosphere because of the pressure gradient set up in the film by the higher pressure of the air in the bubble. The rate of decrease of bubble radius with time may be used as a direct measure of the permeability of the surface film to air, or a 'permeability' constant may be calculated. Low permeability is associated with high stability foams, whereas solutions yielding foams of poor stability show very high permeability to air for the adsorbed surface film. Factors affecting the interpretation of the permeability data are discussed. Both permeability and surface viscosity appear to depend on the coherence developed in the surface film, but the quantitative dependence appears to be different in the two cases. (Author)

**AD-625 345 Fld. 11/11, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**PRIMARY ADSORPTION DURING FOAM FORMATION.**
Technical rept.,
by A. G. Brown, W. C. Thuman, and J. W. McBain. 11 Oct 49, 19p. Rept. no. tr-6
Contract N7onr-321 (02) Proj. SRI-120
Unclassified report

Rept. on The Physical Chemistry and Stability of Bubbles with Special Reference to Aqueous Solutions.

Descriptors: (*Foams, Adsorption), (*Cleaning compounds, Foams), (*Surface-active substances, Foams), Concentration (Chemistry), Volume, Surface tension, Impurities, Films, Colloids, Thermodynamics, Stability, Bubbles

Foam formation as distinct from foam stability was investigated in respect to the effect of detergent concentration. It was shown that foam volume increases with increasing concentration in much the same way as does the surface tension lowering of the solutions, and similarly gives a marked change in slope of the curve in the region of the critical concentration. Direct determinations of the composition of the surface film adsorbed on the bubbles of a foam indicated that adsorption is much more rapid below than above the critical concentration, and also provided further evidence that adsorbed films for pure detergents are highly expanded but may be condensed by relatively small amounts of an 'impurity.' It is suggested that both foam stability and foam formation depend on the formation of an adsorbed surface film and thus on the thermodynamics of colloidal solutions. The adsorbed film involved in foam stability represents true equilibria whereas foam formation is a dynamic process and thus also may depend on the kinetics of the processes involved in reaching such equilibria. (Author)

**AD-625 346 Fld. 11/11, 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**THE PHYSICAL CHEMISTRY AND STABILITY OF BUBBLES WITH SPECIAL REFERENCE TO AQUEOUS SOLUTIONS. SURFACE VISCOSITY OF DETERGENT SOLUTIONS AS A FACTOR IN FOAM STABILITY.**
Technical rept.,
by A. G. Brown, W. C. Thuman, and J. W. McBain. 11 Oct 49, 28p. Rept. no. sri-TR-4
Contract N7onr-321 (02) Proj. SRI-120
Unclassified report

Descriptors: (*Detergents, Viscosity), (*Foams, Stability), (*Bubbles, Stability), Solutions, Surface properties, Viscosimeters, Permeability, Films, Fluid flow

'Surface viscosity' data were obtained with a group of detergents and detergent mixtures, selected to illustrate the role of 'surface viscosity' in the stability of the foams obtained from these solutions. A rotational type viscometer suitable for this purpose has been developed and is described in detail. High surface viscosity was found to be associated with high foam stability and low surface viscosity with poor stability. High foam stability appears to depend on both high surface viscosity and on low permeability of the film to gas. A 'duplex' theory of foaming is proposed, based on the results obtained with special detergent mixtures. It is suggested that detergents of high foam stability are in reality two or more compounds, one of which has high solubility and provides a reservoir of surface-active material of poorly developed coherence, and the other of which, though less in amount and also less soluble, provides the necessary coherence in the mixed film.

## 12/1. MATHEMATICS AND STATISTICS

**AD-624 863 Fld. 12/1**
*HARVARD UNIV CAMBRIDGE MASS*
**PIECEWISE POLYNOMIAL INTERPOLATION AND APPROXIMATION,**
by Garrett Birkhoff, and Carl R. De Boor. 1965, 28p.
Unclassified report

*Availability: Published in Approximation of Functions, p164-90 1965. Copies to DDC users only.*

Descriptors: (*Polynomials, Functional analysis), (*Functional analysis, Polynomials), (*Approximation (Mathematics), Polynomials), Integral equations, Differential equations, Boundary value problems

**AD-624 876 Fld. 12/1**
*HARVARD UNIV CAMBRIDGE MASS*
**ESSENTIALLY POSITIVE SYSTEMS OF LINEAR DIFFERENTIAL EQUATIONS,**
by Garrett Birkhoff, and Leon Kotin. 17 May 65, 2p.
Unclassified report

Prepared in cooperation with Army Electronics Labs., Fort Monmouth, N. J.

*Availability: Published in Bulletin of the American Mathematical Society v71 n5 p771-2 Sep 1965. Copies to DDC users only.*

Descriptors: (*Differential equations, Asymptotic series), Matrix algebra

A theorem is proved which is itself helpful in proving the convergence of all positive solutions of an essentially positive system of linear differential equations to a unique limiting asymptotic behavior as t becomes unbounded.

**AD-624 899 Fld. 12/1, 6/3, 6/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*MICHIGAN STATE UNIV EAST LANSING DEPT OF STATISTICS*
**ON THE GENERAL STOCHASTIC EPIDEMIC,**
by J. Gani. Sep 65, 11p. Rept. no. rm-144, JG-8
Contract Nonr-2587 (05) Grant ,PHS-GM-13138-01
Unclassified report

Descriptors: (*Stochastic processes, Epidemiology), (*Epidemiology, Stochastic processes), Biometry, Mathematical models

**AD-625 010 Fld. 12/1, 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FRANK J SEILER RESEARCH LAB AIR FORCE ACADEMY COLO*
**COMPUTATIONAL PROCEDURES FOR SENSITIVITY COEFFICIENTS IN TIME-INVARIANT MULTIVARIABLE SYSTEMS.**

Final scientific rept.,
by Bernard S. Morgan,Jr.. 13 Oct 65, 20p. Rept. no. srl-65-0004
Proj. AF-7904 Task 790400
Unclassified report

Descriptors: (*Programming (Computers), Matrix algebra), (*Input-output devices, Sensitivity), Differential equations, Functions, Time, Invariance, Digital computers, Control systems

This paper considers a linear time-invariant multivariable (multiple input-output) system represented by a system of first-order differential equations. Procedures, which can be easily programmed on a digital computer, are presented for the determination of: (1) the system transfer-function matrix; (2) sensitivity coefficients for the transfer-function matrix in terms of system parameters. (Author)

**AD-625 048 Fld. 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*RESEARCH ANALYSIS CORP MCLEAN VA*
**A GENERAL THEORY OF FINITE SEQUENTIAL DECISION PROCESSES.**
Technical paper,
by Peter C. Fishburn. Feb 65, 32p. Rept. no. rac-TP-143
Contract DA-44-188-ARO-1
Unclassified report

Descriptors: (*Decision theory, Sequential analysis), (*Sequential analysis, Decision theory), Mathematical programming, Statistical processes, Optimization, Probability, Game theory

This paper discusses the structure and analysis of sequential decision processes within the restriction of a formulation involving only finite sets. A definition of the phrase 'finite sequential decision process' is presented, using the notions of action sets, outcome sets, conditional probabilities, histories, and availability functions. To the best of our knowledge this formulation is more general than any presented to date, and it is designed to fill an existing gap in the literature of sequential decision processes. The latter part of the paper examines special conditions of homogeneity, availabilities, probabilities, and utilities that reduce the general process to special cases, some of which have been discussed in the literature. Along the way a general expected-utility decision model is presented for the general finite process. The model is based on utilities of terminal histories and probabilities of terminal histories conditioned by strategies. The definition of strategy is based on the notion of decision functions for the various stages of the process. A backward-computational approach for obtaining optimal decision functions is discussed. (Author)

**AD-625 081 Fld. 12/1, 9/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*PARKE MATHEMATICAL LABS INC CARLISLE MASS*
**THE ALGEBRA OF BLOCK DIAGRAMS,**
by John A. Riley. Sep 65, 34p. Rept. no. scientific-2
Contract AF19 (628)-4790 Proj. AF-4608 Task 460805
AFCRL 65-805
Unclassified report

Descriptors: (*Algebras, Input-output devices), (*Input-output devices, Algebras), Graphics, Mathematical models, Feedback, Sequences

Free substitution algebras are defined, and their basic properties are derived using the standard techniques of 'universal' algebra. The theory is applied to give a purely algebraic definition of block diagrams (and/or functional nets). A heuristic demonstration is given showing the identify of the present treatment of diagrams with the more geometric approach via labeled graphs. (Author)

**AD-625 206 Fld. 12/1, 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*NEW YORK UNIV N Y*
**AN APPROXIMATE SOLUTION OF THE CROCCO EQUATION,**
by Charles J. Ruger. Oct 65, 46p. Contract AF33 (615)-2215 Proj. AF-7064 ARL 65-21
Unclassified report

Descriptors: (*Approximation (Mathematics), Differential equations), (*Perturbation theory, Fluid mechanics), Boundary layer, Theory, Pressure, Shear stresses, Hypersonic flow, Series, Integration

The Crocco equation for zero pressure gradient and a constant viscosity-density product is linearized and the results applied to boundary layer problems where the given initial profile is much different from Blasius profile. Three linearization assumptions are used, each of which leads to an eigenvalue problem having a discrete spectrum of eigenvalues. This allows the shear stress to be expressed as a series. Far downstream of the initial station the first term of this series dominates. Solutions valid in this region are obtained for each assumption and are compared to the exact similar solution. The best of the three assumptions is applied to two examples where it is desired to find the flow behind a region having mass injection. Comparison to finite difference solutions shows the present solution to be satisfactory and superior to solutions obtained by perturbations from the Blasius solution. (Author)

**AD-625 264 Fld. 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*WISCONSIN UNIV MADISON DEPT OF STATISTICS*
**MIXTURE DESIGNS FOR FOUR FACTORS.**
Technical rept.,
by Norman R. Draper, and Willard E. Lawrence.
Mar 65, 25p. Rept. no. tr-48
Contract Nonr-1202 (17) Proj. NR-042-222
Unclassified report

Descriptors: (*Factor analysis, Experimental design), (*Experimental design, Factor analysis), (*Combinatorial analysis, Experimental design)

Scheffe, in two recent papers (1958, 1963), has given designs for experimenting with mixtures. The basis of these designs is the choice of symmetrical arrangements of points in the factor space and the fitting of carefully chosen models which have exactly as many coefficients as there are data points. The designs are such that some of the experiments do not contain any of one or more ingredients of the mixture. This may or may not be a disadvantage depending on the problem involved. Here an alternate form of design selection is made for the case of mixtures of four factors. It extends the method used in the three factor case in an earlier paper, (Draper and Lawrence, 1965). This involves the premise that, in the absence of specialist knowledge about the form of the true response function, it is desired to fit a response surface equation of first or second order over the factor space of possible mixtures, and experimental runs are needed which, in a certain sense, ensure the best surface fit possible. The principles used in the choice of appropriate designs will be those originally introduced by Box and Draper (1959). (Author)

**AD-625 269 Fld. 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*WISCONSIN UNIV MADISON DEPT OF STATISTICS*
**MISSING VALUES IN MULTIVARIATE STATISTICS. I. REVIEW OF THE LITERATURE.**
Technical rept.,
by A. A. Afifi, and R. M. Elashoff. Jul 65, 20p.
Rept. no. tr-52
Contract Nonr-1202 (17) Grant ,PHS-43-64-562
Proj. NR-042-222
Unclassified report

Descriptors: (*Multivariate analysis, Reviews), Least squares method, Statistical functions, Stochastic processes

**AD-625 270 Fld. 12/1**
**CFSTI Prices: HC $3.00 MF $0.50**
*WISCONSIN UNIV. MADISON DEPT OF STATISTICS*
**THE USE OF THE CONCEPT OF A FUTURE OBSERVATION IN GOODNESS OF FET PROBLEMS.**
Technical rept.,
by Irwin Guttman. Oct 65, 53p. Rept. no. tr-50
Contract Nonr-1202 (17) Proj. NR-042-222
Unclassified report

Descriptors: (*Statistical tests, Optimization), Probability

**AD-625 271 Fld. 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*WISCONSIN UNIV MADISON DEPT OF STATISTICS*
**BAYESIAN COMPARISON OF MEANS OF A MIXED MODEL WITH APPLICATION TO REGRESSION ANALYSIS.**
Technical rept.,
by George C. Tiao. Apr 65, 37p. Rept. no. tr-49
Contract Nonr-1202 Grant ,NSF-GS-151 Proj. NR-042-222
Unclassified report

Descriptors: (*Mathematical models, Analysis of variance), Distribution theory, Multivariate analysis, S-matrix

**AD-625 272 Fld. 12/1, 9/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF STATISTICS*
**THE SIGN TEST ON AUTOREGRESSIVE DATA.**
Technical rept.,
by S. S. Wolff, J. Gastwirth, and H. Rubin. Nov 65, 21p. Rept. no. tr-39
Contract Nonr-4010 (13) ,Nonr-4010 (09) Proj. NR-042-232
Unclassified report

Prepared in cooperation with Michigan State Univ., East Lansing.

Descriptors: (*Statistical tests, Distribution theory), (*Statistical functions, Correlators), Clipper circuits, Information theory

The sign test is analyzed and shown to lose its distribution-free properties for dependent data of the form Xsubt = pXsubt-1 + Wsubt, t = 1, ..., N, O $p < 1$; (Wsubt) is a strictly stationary sequence of independent, identically distributed random variables with zero mean. Formulas for the mean and variance of the sign test statistic are derived and examples given for Xsubt being Gaussian and double-exponential. The Blum-Rosenblatt Central Limit Theorem for strong mixing processes is used to prove asymptotic normality of the sign test statistic in these two cases. Anomalous results of a Monte Carlo experiment are reported. (Author)

**AD-625 305 Fld. 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**A METHOD OF APPROXIMATE CONFORMAL MAPPING OF POLYGONAL REGIONS ONTO A UNIT CIRCLE,**
by I. S. Khara. 17 Dec 65, 11p. Rept. no. ftd-TT-65-1237
TT 66-60082
Unclassified report

Edited trans. of Akademiya Nauk URSR, Kiev. Dopovidi n4 p289-93 1953.

Descriptors: (*Numerical methods + procedures, Conformal mapping), (*Conformal

mapping, Numerical methods + procedures), Integrals, Functions, USSR

The paper proposes a general method for approximate conformal mapping of polygonal regions onto the unit circle with the aid of rational functions constructed by use of the classical Christoffel-Schwartz integral. The basis of the proposed method is a new general method for determining approximate values of the constants in the Christoffel-Schwartz integral on the basis of the 'continual correspondence' principle; which has been given the name 'method of generalized proportional division.' In determining approximate values of the constants by the generalized proportional division method, it is no longer necessary to write any equations and, consequently, all of the fundamental difficulties associated with solution of the equations are also eliminated.

**AD-625 322 Fld. 12/1, 9/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*OKLAHOMA CITY AMA TINKER AFB OKLA DIRECTORATE OF MATERIEL MANAGEMENT*
**IMPLEMENTATION OF RECURSIVE PROCEDURES ON THE IBM 7080 COMPUTER USING THE 7058 FORTRAN PROCESSOR.**
Mathematical note,
by John N. Huff. 15 Sep 65, 27p. Rept. no. ocne-MN-65-1

Unclassified report

Descriptors: (*Recursive functions, Coding), Mathematical logic, Compilers, Programming languages, Programming (Computers)

A series of library routines have been added to the OCAMA (Oklahoma City Air Materiel Area) 7058 FORTRAN compiler which permit the coding of recursive procedures. The augmented 7058 FORTRAN code for computing Ackerman's function, defined by A (M, N) = A (M - 1, A (M - 1, A (M, N - 1)), A (M, O) = A (M - 1, 1), and A (O, N) = N + 1, is included, and the results of several runs are presented. Cards decks and instructions for adding the library routines to a 7058 FORTRAN processor library may be obtained from the author by interested federal agencies. (Author)

**AD-625 328 Fld. 12/1, 13/2**
**CFSTI Prices: HC $3.00 MF $0.50**
*NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF*
**AN IMPROVED STEPWISE REGRESSION ANALYSIS PROCEDURE.**
Technical note,
by W. L. Wilcoxson, and J. R. Wohlever. 6 Dec 65, 56p. Rept. no. tn-N-775
Task Y-F015-15-06-513

Unclassified report

Descriptors: (*Least squares method, Optimization), Programming (Computers), Operations research, Programming languages, Albedo, Backscattering, Gamma rays, Concrete

Stepwise regression analysis is a least squares method for estimating an empirical linear relationship between variables. This method is implemented by the computer program STRAP with FORMAT, Version 2, for the IBM 1620 Card or Paper Tape Data Processing System with 20,000 positions of storage and no special features. Some of the capabilities of this program are found only in programs for very large machines, if at all. The many statistics, optional output and flexible data formats provide a powerful program to satisfy the requirements for many applications at the Laboratory. (Author)

**AD-625 334 Fld. 12/1, 16/4**
**CFSTI Prices: HC $6.00 MF $1.25**
*ARMY MISSILE COMMAND REDSTONE ARSENAL ALA*
**TAMPER: TABLES FOR APPROXIMATION OF MID-POINTS FOR EXPONENTIAL REGRESSION.**
Dec 65, 218p.

Unclassified report

Descriptors: (*Tables, Quality control), (*Algebra, Tables), Guided missiles, Statistical analysis, Approximation (Mathematics)

The tables were designed and developed for a rapid as well as a reliable means of estimating algebraic lot midpoints. They will reduce the computation of a mid-point from 20 minutes to less than 2 minutes. These tables are arrays of ratios that are associated with specific lots and Experience Curve slopes. These ratios represent the percent of the units in the lot that is added to the first unit of the lot to determine the algebraic lot mid-point.

**AD-625 355 Fld. 12/1, 20/8**
*LABORATOIRE DE PHYSIQUE THEORIQUE ET HAUTES ENERGIES ORSAY (FRANCE)*
**THE RICCATI EQUATION AND REGGE POLES,**
by K. Chadan, and J. Y. Guennegues. 18 May 64, 27p. Contract AF-EOAR-47-63 AFOSR 65-1756

Unclassified report

*Availability: Published in Il Nuovo Cimento v34 (Ser10) p665-89 1964. Copies to DDC users only.*

Descriptors: (*Differential equations, Complex variables), (*Nuclear scattering, Differential equations), Potential theory, Transformations (Mathematics), Quantum mechanics

The Schrodinger equation with a central potential is transformed into a Riccati equation by the well-known methods of the theory of ordinary differential equations. The equation is chosen in such a way that its solution, in the limit r approaches infinity, gives the scattering amplitude. By studying the analyticity of the solution and of its limit, one can therefore obtain information on the domains in energy and angular momentum where poles cannot lie. As it is shown, the limitations one obtains on the location of Regge poles are very severe. For usual superpositions of Yukawa potentials, poles in the lambdaplane must lie in small finite domains for all energies in a large region of the complex plane. In particular, this region includes the whole real positive energy axis (E>or=0). As a result, dispersion relations in momentum transfer need at most a finite number of subtractions. Finally, the amplitude is shown to vanish when lambda goes to infinity in the entire right-hand half-plane, including the imaginary axis. (Author)

**AD-625 372 Fld. 12/1, 9/2**
**CFSTI Prices: HC $4.00 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**AN ANALOG COMPUTER STUDY OF VAN DER POL'S EQUATION AND ITS RESPONSE TO WHITE GAUSSIAN NOISE.**
Master's thesis,
by Eugene O. Conley. Jun 65, 102p. Rept. no. gaw/mech/65-24

Unclassified report

Descriptors: (*Nonlinear differential equations, Analog computers), (*Analog computers, Nonlinear differential equations), Simulation, Noise generators, Stochastic processes

Van der Pol's equation has a nonlinearity in the first derivative term and characteristics of the equation vary with a constant in the nonlinear term. Results of a computer study of the homogeneous equation compare favorably with phase plane data and periods obtained by numerical methods. Computer analysis of responses to random excitation show that the rms decreases exponentially toward the rms of the unexcited system as the constant in the nonlinear term is increased for constant noise input. Frequencies of the excited response become more random as excitation spectral density is increased but the predominant frequency is the same as for the homogeneous equation. The work presented is the result of an analog computer study of the response of the well-known and widely studied nonlinear van der Pol equation to different power spectral intensities of random white gaussian noise inputs. The results are presented in the form of time history plots and graphs of the amplitude response of van der Pol's equation to different noise spectral intensities and different constant coefficients of the nonlinear term in the equation. (Author)

**AD-625 412 Fld. 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**CONCERNING THE ROOTS OF A POLYNOMIAL WHICH CONTAIN A PERTURBATION PARAMETER,**
by Wm. D. Moseley Jr.. 15 May 65, 9p. Rept. no. scientific-42
Contract AF61 (052)-701 ARL 65-258

Unclassified report

Descriptors: (*Polynomials, Functional analysis), Algorithms, Differential equations, Taylor's series, Perturbation theory

It is demonstrated that the recurrence algorithm presented by Hollingsworth and Schumacher can be simplified to require knowledge of one root only to evaluate the same root for other values of the parameter in question. (Author)

**AD-625 456 Fld. 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*WISCONSIN UNIV MADISON DEPT OF STATISTICS*
**A CHANGE IN LEVEL OF A NON-STATIONARY TIME SERIES.**
Technical rept.,
by G. E. P. Box, and George C. Tiao. Oct 64, 26p. Rept. no. tr-43
Contract Nonr-1202 (17)

Unclassified report

Descriptors: (*Statistical analysis, Optimization), (*Series, Time), Mathematical models, Stochastic processes, Operations research

Suppose that observations zsubt of a time series are available at equally spaced time intervals. The authors consider the problem of making inferences about a possible shift in level of the series associated with the occurrance of an event E at some particular time. For example, the observations might be of some economic indicator and one might suspect a change in level to occur in a particular interval because of a change in fiscal policy. Alternatively, zsubt could be the daily output of a chemical process and the event E might be a change in the supplier of raw material.

**AD-625 477 Fld. 12/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*JOHNS HOPKINS UNIV BALTIMORE MD*
**ON THE ZETA FUNCTION OF A HYPERSURFACE,**
by Bernard Dwork. 1962, 65p. Contract NSF-G7030 ,DA-ORD-31-124-61-G95

Unclassified report

Descriptors: (*Special functions (Mathematical), Algebraic geometry), (*Number theory, Algebra), Polynomials, Power series, Real numbers, Operators (Mathematics), Topology

This article is concerned with the further development of the methods of p-adic analysis used in an earlier article to study the zeta function of an algebraic variety defined over a finite field. These methods are applied to the zeta function of a nonsingular hypersurface of degree d in projective n-space of characteristic p defined over the field of q elements.

**AD-625 488 Fld. 12/1, 9/2**
**CFSTI Prices: HC $3.00 MF $0.50**

*CAMBRIDGE LANGUAGE RESEARCH UNIT (ENGLAND)*
**A SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.**
Final rept. for period ending 31 Mar 65,
by E. W. Bastin, Ted Bastin, A. F. Parker-Rhodes, and D. S. Linney. 1 May 65, 55p. Contract AF-EOAR-63-64 Proj. AF-9769 Task 9769-06
AFOSR 65-1883
Unclassified report

Includes: Mathematics of a Hierarchy of Brouwerian Operations; An Operational Hierarchy and The Theory of the Yellow Line.

Descriptors: (*Mathematical logic, Information theory), (*Information theory, Mathematical logic), Algebras, Matrix algebra, Set theory, Decision theory, Probability, Automata, Mathematical models, Time, Vector analysis

Results are reported of three studies based in part on the intuitionist logic of L. E. J. Brouwer. In 'Mathematics of a Hierarchy of Brouwerian Operations,' by E. W. Bastin, an algebraic system is used to represent the structure provided by the total set of decisions that can be made about the progress of any Brouwer time sequence. Concepts of level, element of level, and hierarchy of levels are introduced. It is shown that an element of a given level determines a decision about the progress of a sequence by specifying two contiguous terms at the adjacent simpler level of the hierarchy. Each element of a given level is then considered as an operator on the elements at the adjacent simpler level, and as being in the relation of operand to the elements at the adjacent more complex level. In 'An Operational Hierarchy,' by A. F. Parker-Rhodes, an algebraic structure is described for automata which perform a sequence of operations, each of which restricts the range of operations which can follow it, in such a way that the sequence eventually terminates. The model is based on representing the operations of the sequence by linear transformations on vector spaces over the field of elements J sub 2. (Author)

**AD-625 557 Fld. 12/1**
*BOSTON UNIV MASS DEPT OF PHYSICS*
**A THEOREM ON THE ZEROS OF CAUSAL TRANSFORMS,**
by A. S. Marathay, and P. Roman. 4 Oct 64, 4p.
Contract AF-AFOSR-385-63 AFOSR 65-1754
Unclassified report

*Availability: Published in Il Nuovo Cimento (Italy) v34 (s10) p-1821-2 1 Dec 1964. Copies to DDC users only.*

Descriptors: (*Number theory, Integral transforms), (*Integral transforms, Number theory), Theorems, Complex numbers

**AD-625 560 Fld. 12/1, 5/6**
**CFSTI Prices: HC $3.00 MF $0.50**
*STANFORD UNIV CALIF DEPT OF STATISTICS*
**STATISTICAL METHODS OF TIME SEQUENCING.**
Technical rept.,
by Haim Sternin. 22 Nov 65, 52p. Rept. no. tr-112
Contract Nonr-225 (52) Proj. NR-342-022
Unclassified report

Descriptors: (*Statistical data, Archeology), (*Archeology, Statistical data), Time, Sequences, Matrix algebra, Permutations

The problem of ordering archeological artifacts in their correct time-sequence is the motivation for the mathematical developments and the results which are reported. The following model is assumed. For each deposit located there corresponds a population; the artifacts found in the deposit are a sample drawn from that population. Suppose, for example, that varying quantities of different types of pottery are found at several locations. Here, there exists a positive symmetric measure of similarity d sub jk between the jth and the kth population. If the deposits are labeled from 1 to n according to the correct time sequence, then the following holds: (1) d sub jk > d sub ji for i > k > j and d sub jk > d sub ji for i < k < j. The problem of ordering is formulated as follows: Let D be an unknown matrix satisfying (1). Let P be an unknown permutation matrix and let C be an error matrix. The matrix U = PDP' + C is observed. P is to be determined. A procedure to determine P is proposed and its performance is investigated. For some classes of matrices which satisfy (1), the components of the eigenvectors have special rank-order properties. The procedure is based on these properties. The procedure is applied to three matrices computed from archaeological data. The procedure is applied also to matrices whose elements are compoundsed with random errors generated by simulation. It is successful even when the errors have large variances. (Author)

**AD-625 654 Fld. 12/1**
*TEXAS UNIV AUSTIN*
**DISCRETE REPRESENTATIONS OF PARTIAL DIFFERENTIAL OPERATORS.**
by David M. Young, and John H. Dauwalder.
1963, 39p. Contract DA-ARD (D)-31-124-G388, NSF-GP-217 AROD 3772:9
Unclassified report

*Availability: Published in Error in Digital Computation v2 p181-217 1965. Copies to DDC users only.*

Descriptors: (*Operators (Mathematics), Partial differential equations), Approximation (Mathematics), Errors, Taylor's series, Boundary value problems

**AD-624 865** **See Fld. 20/10**

**AD-624 866** **See Fld. 9/4**

**AD-624 950** **See Fld. 20/8**

**AD-624 998** **See Fld. 20/9**

**AD-625 058** **See Fld. 20/4**

**AD-625 162** **See Fld. 20/11**

**AD-625 200** **See Fld. 9/1**

**AD-625 201** **See Fld. 9/1**

**AD-625 222** **See Fld. 5/9**

**AD-625 223** **See Fld. 5/9**

**AD-625 224** **See Fld. 5/9**

**AD-625 235** **See Fld. 9/2**

**AD-625 453** **See Fld. 22/3**

**AD-625 551** **See Fld. 4/1**

**AD-625 594** **See Fld. 20/10**

**AD-625 596** **See Fld. 20/8**

**AD-625 597** **See Fld. 20/10**

## 12/2. OPERATIONS RESEARCH

**AD-625 047 Fld. 12/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*RESEARCH ANALYSIS CORP MCLEAN VA*
**MODERN UTILITY THEORY: 1940-1970.**
Technical paper,
by Peter C. Fishburn. Sep 65, 48p. Rept. no. rac-TP-160
Contract DA-44-188-ARO-1
Unclassified report

Descriptors: (*Game theory, State-of-the-art reviews), History, Decision theory, Probability, Stochastic processes

The paper reviews significant developments in utility theory during the past twenty-five years, beginning with the axioms of von Neumann and Morgenstern, and then indicates where additional development may come in the next several years. Axiomatic systems and their main implications for a variety of areas in utility theory are are discussed. Included are three approaches to cardinal utility theory (gambles, preference -differences, stochasticchoice probabilities) and an axiomatization of multidimensional utility theory, as well as a number of related topics, including independence, additivity, and stationarity. Ties between axiomatic systems are noted. The paper also presents two related axiomatizations of subjective probability and utility and discusses the relevance of utility theory in decision theory, in both its predictive and prescriptive phases. (Author)

**AD-625 050 Fld. 12/2, 5/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*RESEARCH ANALYSIS CORP MCLEAN VA*
**APPLICATION OF CHANCE-CONSTRAINED PROGRAMMING TO SOLUTION OF THE SO-CALLED 'SAVINGS AND LOAN ASSOCIATION' TYPE OF PROBLEM,**
by Abraham Charnes, and Michael J. L. Kirby.
Oct 65, 24p. Rept. no. rac-P-12
Contract Nonr-1228 (10) Proj. NR-047-021,EF00355-01
Unclassified report

See also AD-623 094.

Descriptors: (*Mathematical programming, Management planning), (*Economics, Decision theory), (*Stochastic processes, Linear programming), Decision making, Money, Optimization

This paper contains an application of chance-constrained programming to a problem in financial planning. In particular the problem is one of planning for liquidity in a savings and loan association first discussed by Charnes and Thore. The optimal rules for this problem are found and compared with the optimal linear rules given by Charnes and Thore. The discontinuous nature of the optimal rules is discussed from economic and control theory viewpoints. (Author)

**AD-625 365 Fld. 12/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY*
**PRIMAL-DUAL DECOMPOSITION PROGRAMMING.**
Research rept.,
by Earl J. Bell. Aug 65, 42p. Rept. no. orc-65-23
Contract Nonr-222 (83) ,DA-31-124-ARO (D)-331 Proj. RR-003-07-01
Unclassified report

Descriptors: (*Linear programming, Optimization), Matrix algebra, Scheduling, Calculus of variations, Transportation, Algorithms

A primal-dual method for solving linear programs with a block-angular matrix structure is presented which employs the Decomposition Principle of Dantzig and Wolfe, who first studied this structure. Preliminary results indicate that the proposed method is more efficient than the standard decomposition method which uses the twophase simplex method to solve an equivalent 'extremal program' with a reduced basis size whose coefficients are generated through the solution of linear subprograms. By contrast, the proposed method employs a primal-dual method and the coefficients are generated through subprograms with nonlinear objectives. These subprograms involve the maximization of a quotient of two linear functions subject to linear constraints in nonegative variables. Such problems are known as linear-fractional, rational objective, or hyperbolic programs and can be solved as a variant of standard linear program-

ming. Under the conditions imposed by the primal-dual method, special parametric techniques can be employed to take advantage of particular matrix structures, such as the transportation structure, exhibited by the subprograms. (Author)

**AD-625 503 Fld. 12/2**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**PATHS, TREES, AND FLOWERS,**
by Jack Edmonds. 22 Nov 63, 29p. AROD 3532:1
Unclassified report

*Availability: Published in Canadian Journal of Mathematics v17 p449-67. Copies to DDC users only.*

Descriptors: (*Graphics, Topology), Combinatorial analysis, Linear programming, Algorithms, Optimization

**AD-625 504 Fld. 12/2**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**ON THE SURFACE DUALITY OF LINEAR GRAPHS,**
by Jack Edmonds. 3 Feb 64, 3p. AROD 3532:3
Unclassified report

*Availability: Published in Journal of Research of the National Bureau of Standards-B. Mathematics and Mathematical Physics v69B n1/2 Jan-Jun 1965. Copies to DDC users only.*

Descriptors: (*Graphics, Theorems), (*Linear programming, Graphics), Topology, Mapping (Transformations)

The objective of the work is the Theorem: A 1-1 correspondence between the edges of two connected graphs is a duality with respect to some polyhedral surface embedding if and only if for each vertex v of each graph, the edges which meet v correspond in the other graph to the edges of a subgraph G sub v which is connected and which has an even number of its edge-ends to each of its vertices (where if an edge meets v at both ends its image in G sub v is counted twice). Using the Euler formula, the characteristic of the surface is determined by the two graphs. Thus, the theorem generalizes a variation of the H. Whitney condition for a graph to be planar. (Author)

**AD-625 505 Fld. 12/2**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**MINIMUM PARTITION OF A MATROID INTO INDEPENDENT SUBSETS,**
by Jack Edmonds. 1 Dec 64, 6p. AROD 3532:5
Unclassified report

Presented at Seminar on Matroids, National Bureau of Standards, Washington, D. C. 31 Aug-11 Sep 1964.

*Availability: Published in Journal of Research, National Bureau of Standards-B. Mathematics and Mathematical Physics v69B n1/2 p67-72 Jan-Jun 1965. Copies to DDC users only.*

Descriptors: (*Matrix algebra, Set theory), (*Set theory, Matrix algebra), (*Combinatorial analysis, Matrix algebra), Graphics, Topology, Linear programming

A matroid M is a finite set M of elements with a family of subsets, called independent, such that (1) every subset of an independent set is independent, and (2) for every subset A of M, all maximal independent subsets of A have the same cardinality, called the rank r (A) of A. It is proved that a matroid can be partitioned into as few as k sets, each independent, if and only if every subset A has cardinality at most k,r (A). (Author)

**AD-625 506 Fld. 12/2**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**LEHMAN'S SWITCHING GAME AND A THEOREM OF TUTTE AND NASH-WILLIAMS,**
by Jack Edmonds. 1 Dec 64, 5p. AROD 3532:6
Unclassified report

*Availability: Published in Journal of Research of the National Bureau of Standards-B. Mathematics and Mathematical Physics v69B n1/2 p73-77 Jan-Jun 1965. Copies to DDC users only.*

Descriptors: (*Game theory, Matrix algebra), (*Matrix aglebra, Graphics), (*Set theory, Matrix algebra), Combinatorial analysis, Theorems, Linear programming

The results cited in the title are unified by the following theorem: For any matroid M and any subsets N and K of elements in M, there exist as many as k disjoint subsets of N which span K and which span each other if and only if there is no contraction matroid M X A where N intersects A partitions into as few as k sets such that each is independent in M X A and such that at least one of them does not span K intersects A in M X A. (Author)

**AD-625 507 Fld. 12/2**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**MAXIMUM MATCHING AND A POLYHEDRON WITH 0,1-VERTICES,**
by Jack Edmonds. 1 Dec 64, 6p. AROD 3532:9
Unclassified report

*Availability: Published in Journal of Research of the National Bureau of Standards-B. Mathematics and Mathematical Physics v69B n1/2 p125-30 Jan-Jun 1965. Copies to DDC users only.*

Descriptors: (*Graphics, Optimization), (*Convex sets, Graphics), Combinatorial analysis, Algorithms, Linear programming, Matrix algebra

A matching in a graph G is a subset of edges in G such that no two meet the same node in G. The convex polyhedron C is characterized, where the extreme points of C correspond to the matchings in G. Where each edge of G carries a real numerical weight, an efficient algorithm is described for finding a matching in G with maximum weight-sum. (Author)

**AD-624 898 See Fld. 8/8**

**AD-624 943 See Fld. 9/2**

**AD-625 002 See Fld. 5/1**

**AD-625 135 See Fld. 15/7**

## 13/1. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

**AD-625 140 Fld. 13/1, 13/9, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*IMAGE INSTRUMENTS INC NEWTON LOWER FALLS MASS.*
**DEVELOPMENT OF COOLING DEVICE IN ACCORDANCE WITH BUREAU OF SHIPS.**
Interim development rept. for 1 Jul-30 Sep 65. 30 Sep 65, 43p. Contract NObsr-93424
Unclassified report

Descriptors: (*Cooling fans, Axial-flow fans), Naval equipment, Miniature electrical equipment, Gas bearings, Test equipment, Gas flow, Journal bearings, Performance (Engineering), Design

The report details progress in three areas: development of an air measuring system for air deliveries in 1-5 cubic-feet per minute range, development of a miniature vaneaxial fan and early test results, and design of an air bearing system suitable for use with the miniature vaneaxial fan. (Author)

**AD-625 292 Fld. 13/1, 20/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**THERMOELECTRIC COOLING AND ITS PRACTICAL APPLICATION,**
by A. R. Regel', and E. A. Kolenko. 8 Dec 65, 20p. Rept. no. ftd-TT-65-1055
TT 66-60070
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Vestnik, n5 p86-92 1964.

Descriptors: (*Peltier effect, Cooling + ventilation equipment), (*Cooling + ventilation equipment, Thermocouples), (*Thermoelectricity, Cooling + ventilation equipment), (*Semiconductors, Thermocouples), Cooling, Energy conversion, Refrigeration systems, USSR

Thermoelectric cooling utilizing semiconductor devices.

**AD-625 436 Fld. 13/1, 13/13**
**CFSTI Prices: HC $3.00 MF $0.75**
*SOUTHWEST RESEARCH INST SAN ANTONIO TEX*
**THE STUDY AND EVALUATION OF ABSORPTION-BASED COOLING SYSTEMS FOR USE IN CIVIL DEFENSE SHELTERS.**
Final rept., 1 Jul 64-31 Jul 65,
by J. E. Ambrose, and G. E. Commerford. 30 Dec 65, 87p. Contract OCD-PS-64-201 Proj. 1400, SwRI-01-1580 Task 1420
Unclassified report

Descriptors: (*Fallout shelters, Cooling + ventilating equipment), (*Cooling + ventilating equipment, Fallout shelters), Civil defense systems, Absorption, Effectiveness, Costs, Weight, Furnaces, Fuels, Confined environments

A study has been made of various absorption cycle cooling units and associated components which would be required to maintain a habitable atmosphere in certain identified civil defense fall-out shelters, independent of any external energy sources. Of the many criteria which could be applied to these systems, four were selected as the bases for the final evaluation, e.e., cost, electrical requirement, volume and weight. The selected system consists of the aqueous ammonia absorption cycle cooling unit with heat rejection directly to ambient air from finned-tube condenser and absorber. This unit produces chilled water which is circulated through a finned-tube conditioning coil within the shelter area. Shelter heat is transferred to the chilled water by blowing shelter air and ventilation air through the conditioning coil. Heat to operate the absorption unit is supplied by combustion gases from a furnace designed to burn a volatile-producing fuel with coal as the preferred fuel. Manual power is applied to pump the chilled water and to circulate shelter air and cooling air. A suitably designed furnace needs to be developed, and the normally gas-fired absorption unit must be adapted to the furnace. (Author)

**AD-625 259 See Fld. 13/10**

**AD-625 306 See Fld. 14/2**

**AD-625 367 See Fld. 20/13**

## 13/2. CIVIL ENGINEERING

**AD-625 172 See Fld. 15/3**

**AD-625 267 See Fld. 20/13**

**AD-625 328 See Fld. 12/1**

**AD-625 396 See Fld. 19/4**

**AD-625 443 See Fld. 8/13**

**AD-625 447 See Fld. 8/5**

**AD-625 601 See Fld. 14/2**

## 13/3. CONSTRUCTION EQUIPMENT, MATERIALS AND SUPPLIES

**AD-625 458 See Fld. 11/2**

## 13/6. GROUND TRANSPORTATION EQUIPMENT

**AD-625 350 Fld. 13/6, 22/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**LUNAR SURFACE VEHICLES, A BRIEF REVIEW OF CURRENT DESIGN CONCEPTS,**
by P. H. Bliss. Mar 63, 21p. Rept. no. p-2728
Unclassified report

Descriptors: (*Lunar surface vehicles, State-of-the-art reviews), Reliability, Trafficability, Life support, Tracked vehicles, Vehicle wheels, Design

The most desirable attributes of a vehicle designed to traverse the surface of the Moon are absolute dependability, trafficability over any surface, and provisions for life support. But the design of such a vehicle is complicated not only by the uncertainties concerning the lunar surface itself but also by the extremes of an environment that is hostile both to man and machine. Although the design trend for lunar vehicles seems to favor conventional wheels and tracks for surface contact, some unconventional designs, such as spiral-screw vehicles and walking machines, are being worked on. Until more lunar data become available, the study and testing of a variety of designs, each based on certain assumptions about conditions on the Moon, will continue to be necessary. (Author)

**AD-625 390 Fld. 13/6, 8/13**
**CFSTI PricesMF $0.75**
*ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS*
**A STUDY OF THE EFFECTS OF WET SURFACE SOIL CONDITIONS ON THE PERFORMANCE OF A SINGLE PNEUMATIC-TIRED WHEEL.**
Final rept.,
by Jerry L. Smith. Nov 65, 87p. Rept. no. tr-3-703
Contract arpa order-400
Unclassified report

*Availability: Available from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., $1.00.*

Descriptors: (*Soils, Trafficability), (*Tires, Performance (Engineering)), Surface properties, Vehicle wheels, Loading (Mechanics), Soil mechanics, Friction, Moisture, Clay, Shear stresses, Tensile properties, Tire chains, Test equipment

A test program was conducted to determine the effects of wet surface soil conditions on the performance of pneumatic tires. The surface soil conditions were of three types: (a) unflodded (as compacted), (b) flooded and undrained, and (c) flooded and drained. Most of the tests were conducted with one soil (fat clay) and one tire deflection (35 percent). All test tires were 6.00-16, 4-PR. Four tire surfaces, called tread patterns in this report, were tested: a smooth tire (i.e. no tread), a directional tread, a nondirectional tread, and a smooth tire with a traction aid. Test results showed that in soils exhibiting nonuniform soil-strength profiles, the type and extent of the nonuniformity largely controlled the tire performance. For a given wheel load, the loss of pull due to flooding, expressed as a percentage of the pull in the unflooded condition, was essentially constant for each tread pattern. The treated tires and the smooth tire with traction aid performed better than the smooth tire in flooded soil. In the unflooded soil, the tread pattern made a considerable difference in performance. Peak performance usually was attained at an optimum load, regardless of tread pattern or soil condition.

## 13/7. HYDRAULIC AND PNEUMATIC EQUIPMENT

**AD-624 885 Fld. 13/7**
**CFSTI Prices: HC $4.00 MF $1.00**
*MASSACHUSETTS INST OF TECH CAMBRIDGE ENGINEERING PROJECTS LAB*
**BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.**
Progress rept. no. 1, 15 Oct 64-1 Feb 65,
by S.-Y. Lee, H. H. Richardson, F. M. Mitchell, A. H. Levis, and S. E. Goldstein. May 65, 130p. Rept. no. dsr-5393-1
Contract AF33 (615)-2210 Proj. AF-8226 Task 822604
AFFDL TR-65-79
Unclassified report

Descriptors: (*Fluid flow, Control systems), (*Pneumatic systems, Power), Astronautics, Optimization, Jets, Vortices, Valves, Pipes, Thrust bearings, Pneumatic servomechanisms

The report presents technical results and describes progress in several phases of continuing applied research and development related to the design and development of high-performance fluid control devices for advanced aerospace systems. Emphasis continues to be placed on pneumatic components and systems which are capable of performing, with high reliability, over wide-ranges of temperature and in the presence of intense radiation. The report describes current work dealing with a pulse actuation servo system, a pneumatic oscillator, the static modeling of fluid jet modulators, electrostatic pure fluid modulation, optimization of vortex valves, jet pipe inlet coupling, and the dynamic characteristics of gas thrust bearings. (Author)

**AD-624 906 Fld. 13/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PNEUMATIC CONVERTER,**
by V. I. Levin, and A. M. Krupnik. 10 Nov 65, 5p. Rept. no. ftd-TT-65-990
TT 65-64813
Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 183, pub. 16 Nov 62, appl. no. 803550/26-24.

Descriptors: (*Pneumatic devices, Input-output devices), (*Input-output devices, Pneumatic devices), USSR, Patents, Computer logic, Counting methods, Control systems

The object of the invention is a pneumatic converter of any unique r-th code (where 4 is the count of the convertible ordinal numbers) in to any kind of a binary code for use in systems of neutralized monitoring and control. For the purpose of obtaining a nondivergent and rapid device, it is designed on pneumatic logic elements 'or' for two inputs, for example, on elements with a freelying membrane joined for each binary bit into the system 'or' with so many inputs as '1' contains the given binary bit of the table of the binary code. For the purpose of using ehe elements 'or' simultaneously in two or several binary bits in cases where in these bits onto the inputs of the element 'or' there sould be passed identical combinations of convertible input numbers and the outputs of the elements 'or' connected up simultaenously to the inputs of some binary bits. (Author)

**AD-625 079 Fld. 13/7, 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*CONTINENTAL AVIATION AND ENGINEERING CORP DETROIT MICH*
**AXIAL COMPRESSOR DESIGN USING ISENTROPIC OR NONISENTROPIC SIMPLE RADIAL EQUILIBRIUM EQUATION.**
Technical note on Turbine Engineering,
by G. A. Leisterer. 18 May 60, 19p. Rept. no. TN-345
Contract AF33 (600)-40622 Proj. CE-22-02-08
Unclassified report

Descriptors: (*Axial-flow compressors, Design), Equations, Axial-flow compressor blades, Programming (Computers), Velocity, Geometric forms

The report describes four IBM 650 Bell System programs that are used in axial compressor design. These four programs are 722, 673, 665, and 664. Program 722 calculates the velocity triangles based on either an isentropic or nonisentropic simple radial equilibrium equation. Once the velocity triangles are defined, program 673 computes the geometry of double circular arc blades to satisfy the velocity triangles. Program 665 also calculates blade shapes to satisfy the velocity triangles. It differs from program 673 in that the blades calculated in this program are NACA 65 -series blades. Program 664 takes the blade shapes from programs 673 and 665 and calculates the section properties so that structural and vibration analysis can be made on these blades. While these programs can be run individually, they can also be run in sequence since the output from one program can be used as input for the next program. In this manner the blades for a complete stage or stages can be defined by the computer after starting with a given airflow, speed, and pressure ratio.

**AD-625 184 Fld. 13/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**BELLOWS TYPE DEVICE FOR HYDRAULIC REMOTE CONTROL OF AN ACTUATOR,**
by I. S. Timofeev. 8 Dec 65, 10p. Rept. no. ftd-TT-65-1129
TT 66-60028
Unclassified report

Unedited rough draft trans. of Patent (USSR) 163 047, appl. no. 783644/25-8, 21 June 62.

Descriptors: (*Actuators, Remote control systems), (*Remote control systems, Hydraulic devices), Patents, USSR

A device of the bellows type for remote hydraulic control of an actuating mechanism with micrometric adjusting consisting of a pickup with control lever and a receiver with an actuating lever is described. To eliminate temperature errors each pickup and receiver consists of two bellows fastened in a stock with a toothed rack which engages with a pinion set on the axis of the control lever or the actuating lever. Each bellows of the pickup is connected by tubing with one of the bellows of the receiver forming a closed cavity.

## 13/8. INDUSTRIAL PROCESSES

**AD-624 909 Fld. 13/8, 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**RECRYSTALLIZATION OF HIGH-MELTING METALS IN WELDING AND SOLDERING,**
by N. V. Grebtsev, and G. N. Klebanov. 9 Nov 65, 19p. Rept. no. ftd-TT-65-1010
TT 65-64816
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Otdelenie Tekhnicheskikh Nauk. Izvestiya: Metallurgiya i Toplivo, n5 p62-9 1961.

Descriptors: (*Welding, Recrystallization), (*Refractory metals, Recrystallization), (*Thermal joining, Refractory metals), USSR, Molybdenum, Tungsten, Tantalum, Niobium, Soldering, Heating, Temperature

In the rapid heating encountered in welding, the initial recrystallization temperatures of molybdenum and tungsten rise by 250 and 400, respectively, tending toward some limiting value. For tantalum and niobium, this temperature rise amounts to 120-150 and 170-200. Under the conditions of rapid heating, considerable grain growth is observed in molybdenum at temperatures above 1600. It is of value to shorten the duration of heating only for welding conditions under which the basic metal is heated to temperatures near the melting point. In soldering with working temperatures below 1600, the duration of the process has little effect on the grain size of the ground metal. At higher soldering temperatures, it is advisable to heat with high-frequency currents. Among all of the parameters of the welding heat cycle, that exerting the strongest influence on the processes of grain growth in tantalum and niobium is again the heating temperature, followed in order of importance by the holding times above the recrystallization temperature in heating and cooling. Hence these metals must be welded with heavy currents and at high speeds, or sources that ensure highly concentrated heating and deep penetration (electron beam) should be used.

**AD-625 049 Fld. 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*MATERIALS ADVISORY BOARD NAS-NRC WASHINGTON D C*
**METALWORKING PROCESSES AND EQUIPMENT.**
Progress rept. no. 3.
31 Oct 65, 32p. Rept. no. mab-206-M (3)
Contract SD-118

Unclassified report

Descriptors: (*Mechanical working, Metals), (*Lubrication, Material forming), (*Deformation, Metals), (*Extrusion, Performance (Engineering), (*Rolling (Metallurgy), Sheets), Hydrostatic pressure, Industrial equipment

An investigation was made of lubrication in metal working, application of deformation theory to practice, limitations of the extrusion processes, thin sheet rolling.

**AD-625 068 Fld. 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF AUTOMATIC WELDING OF STATIONARY OBJECTS WITH CLOSED LINEAR JOINTS,**
by N. Ya. Kochanovkii, E. S. Feder, and S. M. Katler. 8 Dec 65, 7p. Rept. no. FTD-TT-65-1158
TT 65-64852

Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 981, appl. no. 611412/25, 10 Nov 58.

Descriptors: (*Welding, Automatic), (*Arc welding, Joints), USSR, Magnetic fields, Electrodes, Pipes, Dies, Patents

The object of the invention is a method of automatic welding of immovable objects with a closed line of the seam, for example the nonrotary joints of tubes, with the aid of the electric arc burning between the parts of the object to be welded and shifted along the line of the seam. For the purpose of eliminating moving parts in the welding unit and assuring a uniform heating of the edges the shifting of the arc, including its anode and cathode spots, is accomplished by an immovable magnetic field produced in the zone of the shifting of the arc. The method may be modified by producing the welding arc between the objects to be welded and an auxiliary immovable nonfusible electrode which has the configuration of the outline (contour) to be welded. Nonfusible electrodes may be used one of which envelopes the object and the other placed inside.

**AD-625 069 Fld. 13/8, 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF WELDING BY THE FUSING OF BETATITANIUM ALLOYS,**
by M. V. Poplavko-Mikhailov, L. G. Strizhevskayaand , and L. L. Starova. 8 Dec 65, 4p. Rept. no. FTD-TT-65-1159
TT 65-64853

Unclassified report

Unedited rough draft trans. of Patent (USSR) 167 589, appl. no. 782795/25-8, 14 Jun 62.

Descriptors: (*Welding, Titanium alloys), (*Titanium alloys, Welding), Copper alloys, Iron alloys, Aluminum alloys, Arc welding, USSR, Patents

The object of the invention is a method of welding by the fusing of beta-titanium alloys with copper, iron, aluminum and their alloys. To improve the quality of the welded union, the welding is done after previous fusing on the beta-titanium alloy object a layer of metal corresponding to the metal of the second object to be welded. (Author)

**AD-625 145 Fld. 13/8, 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**SPECIFIC FEATURES IN SOLDERING COPPER WITH GALLIUM-BASE SOLDERS,**
by V. L. Grishin, and S. V. Lashko. 17 Nov 65, 12p. Rept. no. ftd-TT-65-1024
TT 66-60006

Unclassified report

Unedited rough draft trans. of Priborostroenie (USSR) n3 p23-4 1965.

Descriptors: (*Soldering, Copper), (*Gallium alloys, Soldering alloys), USSR, Copper alloys, Heat treatment, Vacuum, Temperature, Powder metals, Effectiveness, Soldered joints

The use of pure gallium as a solder with subsequent heat treatment of the soldered joints at 50 to 605C (Oxidizing atmosphere, vacuum) does not assure a satisfactory strength of the soldered joints, either at room temperature or at high temperature. For obtaining soldered unions with satisfactory strength and high temperature of the unsoldering, a mixture of gallium with very fine powder of copper (30 percent of copper and 70 percent of gallium) is the best. The strength of the soldering and the temperature for the unsoldering are raised with the heating of the soldered joints in a vacuum. Similar heating in the air leads to a lowering of the strength from 6 to 0.5 kg/mm sq.

**AD-625 161 Fld. 13/8, 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**INVESTIGATION OF THE FORMATION OF AN ALPHASOLID SOLUTION OF NITROGEN IN ZIRCONIUM AT HIGH TEMPERATURES,**
by S. E. Salibekov, and Yu. V. Levinskii. 15 Dec 65, 10p. Rept. no. ftd-TT-65-1183
TT 66-60022

Unclassified report

Unedited rough draft trans. of Fizika Metallov i Metallovedenie (USSR) v18 n6 p858-61 1964.

Descriptors: (*Zirconium, Case hardening), (*Case hardening, Zirconium), USSR, High-temperature research, Nitration, Hardness, Solid solutions, Nitrogen, Zirconium compounds, Nitrides, Temperature, Heat of activation

An investigation was made of high-temperature (1400-1700C) nitration of zirconium in a furnace with a molybdenum heater in an atmosphere of nitrogen which contains less than 0.005% of oxygen. By the methods of X-ray-photographic and metallographic analyses and the measurement of the microhardness, there has been established the conformity to law of the growth of the hardest layers-the -solid solution and nitride of zirconium ZrN. An equation has been found which connects the summary thickness of the films of ZrN and the alpha-solid solution with the temperature and time of the nitration, and the energy of the activation of the process of growth of the films has been calculated and it equals 56,290 cal/mole. (Author)

**AD-625 228 Fld. 13/8, 11/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF BONDING POLYAMIDES TO METALS,**
by E. A. Mayorova, and T. V. Ovchinnikova. 25 Oct 65, 5p. Rept. no. ftd-TT-65-796
TT 66-60042

Unclassified report

Unedited rough draft trans. of Patent (USSR) 167 625 (Appl. no. 841008/23-5, 31 May 63) p1.

Descriptors: (*Bonding, Polyamide plastics), (*Polyamide plastics, Bonding), USSR, Patents, Metals, Epoxy plastics, Varnishes, Adhesives

The object of the invention is a method of gluing polyamides to metals with the aid of an epoxy glue. To improve the strength of the bond of the polyamides with metals, the surface of the polyamides to be glued is first covered with a furfuryl lacquer. (Author)

**AD-625 229 Fld. 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ULTRASONIC DEFECTOSCOPY OF TUBES,**
by E. Ya. Veksler, and V. P. Krivusha. 18 Oct 65, 7p. Rept. no. ftd-TT-65-740
TT 66-60043

Unclassified report

Unedited rough draft trans. of Energetik (USSR) n1, p10-1, 1963.

Descriptors: (*Ultrasonic radiation, Non-destructive testing), (*Non-destructive testing, Ultrasonic radiation), (*Pipes, Non-destructive testing), USSR, Defects (Materials), Fracture (Mechanics), Corrosion, Quality control

**AD-625 479 Fld. 13/8, 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*HAMILTON STANDARD DIV UNITED AIRCRAFT CORP WINDSOR LOCKS CONN*
**ELECTRON BEAM TECHNIQUES FOR FABRICATION AND ASSEMBLY OF PARTS FOR ELECTRON TUBES.**
Quarterly rept. no. 8, 1 Apr-30 Jun 65,
by N. H. Ballard. 30 Jun 65, 26p. Contract DA-36-039-AMC-03625 (E)

Unclassified report

See also AD-619 816.

Descriptors: (*Electron tube parts, Manufacturing methods), (*Welding, Electron beams), (*Machining, Electron beams), (*Electron beams, Manufacturing methods), Electron tubes, Contamination, Acceptability

The time-yield indices of the majority of the 6544 electron beam welding operations have been demonstrated; the results compare favorably with the equivalent indices estimated in Phase II, indicating that the contractual production rate will be

complied with. 6914 preproduction tube candidates have been fabricated using tooling and techniques developed during this program. The primary cause of 6914 tube rejection is attributed to contamination which is recognized as a problem common to the photocathode tube industry; steps are being taken to minimize this contamination in pilot line production tubes. (Author)

**AD-624 884** See Fld. 20/12

**AD-625 000** See Fld. 11/8

**AD-625 190** See Fld. 9/1

**AD-625 202** See Fld. 9/1

**AD-625 285** See Fld. 13/9

**AD-625 290** See Fld. 21/5

**AD-625 293** See Fld. 11/6

**AD-625 317** See Fld. 9/1

**AD-625 425** See Fld. 9/1

**AD-625 529** See Fld. 19/1

**AD-625 531** See Fld. 9/1

**AD-625 543** See Fld. 14/2

**AD-625 584** See Fld. 9/1

**AD-625 658** See Fld. 19/1

## 13/9. MACHINERY AND TOOLS

**AD-625 167 Fld. 13/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ULTRASONIC MACHINE TOOL.**
15 Dec 65, 6p. Rept. no. ftd-TT-65-1242
TT 66-60024
Unclassified report

Unedited rough draft trans. of mono. Ultrazvukovoi Stanok, n.p. 1963 p1-2.

Descriptors: (*Machine tools, Ultrasonic radiation), (*Ultrasonic radiation, Drilling), USSR, Drills, Diamonds, Machining, Maintenance, Drilling machines, Specifications

Specifications are given for a ultrasonic machine tool intended for drilling diamond bits of the diameter of 0.3 -1.2 mm and also for the restoration of worn bits.

**AD-625 285 Fld. 13/9, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**DEVICE FOR SPRAYING FERROMAGNETIC FILMS ON A SUBSTRATE IN A VACUUM.**
by N. I. Spinkov, and V. M. Krasilnikov. 15 Nov 65, 6p. Rept. no. ftd-TT-65-991
TT 66-60063
Unclassified report

Unedited rough draft trans. of Russian patent 165 629, appl. no. 822408/22-2, 21 Feb 63, 2p.

Descriptors: (*Industrial equipment, Vapor ating), (*Vapor plating, Ferromagnetic materials), (*Ferromagnetic materials, Films), USSR, Patents, Substrates, Vacuum apparatus, Thickness, Magnetic properties, Sprays, Machines

The object of the invention is a device for spraying ferromagnetic films on sublayers (backing) in a vacuum. To get films that are uniform in thickness and magnetic properties, the sublayers in the cassette or box are arranged vertically on an inner surface of a cylinder rotating around the vaporizer, the axis of which is parallel to the inner magnetic field. (Author)

**AD-625 376 Fld. 13/9**
**CFSTI Prices: HC $3.00 MF $0.75**
*FRANKLIN INST RESEARCH LABS PHILADELPHIA PA*
**EVALUATION OF FRICTION AND WEAR CHARACTERISTICS OF MATERIALS FOR GAS-LUBRICATED BEARINGS UNDER CONDITIONS OF START-STOP, AND WHIRL INDUCED RUBBING.**
Final technical rept.,
by J. G. Hinkle, and D. D. Fuller. Sep 65, 94p.
Rept. no. f-B2232
Contract Nonr-4569 (00) Proj. NR-259-047
Unclassified report

Descriptors: (*Gas bearings, Materials), (*Materials, Gas bearings), Performance (Engineering), Journal bearings, Friction, Wear resistance, Bronze, Iron, Castings, Steel, Stainless steel, Nickel, Halocarbon plastics, Polyethylene plastics, Quartz, Graphite, Tungsten compounds, Carbides, Magnesium compounds, Oxides, Aluminum compounds, Stability

A materials evaluation study was made as applied to 'general' types of self-acting gas-lubricated bearings under start-stop cycling with equal emphasis on ability to sustain whirl-induced solid contact. The study entailed a systematic program of investigation and classification of the performance in a realistic bearing environment of likely combinations of materials, surface treatments, and coatings at four ambient conditions: air at room temperature and atmospheric pressure, air at 300F and atmospheric pressure, nitrogen at room temperature and atmospheric pressure, nitrogen at 300F and atmospheric pressure. Concurrent with the above mentioned tasks, 'bearing' instability characteristics (in contrast to journal instability) were studied experimentally and correlated with theory. (Author)

**AD-625 419 Fld. 13/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*BATTELLE MEMORIAL INST COLUMBUS OHIO*
**DEVELOPMENT OF EQUIPMENT FOR AUTOMATIC NARROW-GAP WELDING FOR SHIPYARD USE.**
Quarterly rept. no. 4,
by R. P. Meister, C. A. Butler, R. E. Monroe, and D. C. Martin. 31 Dec 65, 44p. Contract NObs-90408 Proj. SR007-09-04 Task 875
Unclassified report

Descriptors: (*Welding, Automatic), (*Machines, Welding), Industrial equipment, Temperature control, Infrared equipment, Welding rods, Effectiveness, Controlled atmospheres, Welds

The design of the automatic Narrow-Gap welder was finalized and construction begun. A thermocouple and infrared temperature sensing systems were evaluated and the infrared system selected on the basis of accuracy and ability to measure temperature without direct contact with the heated plate. Twin-wire procedures were developed for flat-position welding with the consumable-insert fiber-glass-tape weld backup. The resulting weld has excellent contour and leaves little reinforcement to be ground off. Narrow-Gap welds in HY-140 steel using Linde X-150 wire were made using both the standard 80 percent argon-20 percent CO2 shielding-gas mixture and a special shielding-gas mixture of 60 percent helium-38 percent argon-2 percent oxygen. All of the welds contained either shrinkage voids or porosity. It is believed that the X-150 wire available was unsatisfactory for Narrow-Gap welding. Attempts to introduce artificial lack-of-fusion defects into Narrow-Gap welds in the flat position indicated that in this position the process is insensitive to large variations in voltage, current, and travel speed. (Author)

**AD-625 423 Fld. 13/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*MECHANICAL TECHNOLOGY INC LATHAM N Y*
**EXPERIMENTS ON ULTRA-STABLE GAS JOURNAL BEARINGS.**
Technical rept.,
by S. B. Malanoski. Nov 65, 37p. Rept. no. mti-65TR37
Contract Nonr-3730 (00) Proj. NR-061-131
Unclassified report

Descriptors: (*Journal bearings, Stability), (*Gas bearings, Stability), Performance (Engineering), Loading (Mechanics), Design, Machining

Shallow grooving in a herringbone pattern was proposed to enhance the stability of both gas and liquid lubricated journal bearings. It was shown theoretically that this possibility is particularly advantageous for unloaded journal bearings. The paper describes corroborating experiments. The experiments included the running of an unloaded bearing up to speeds of 60,000 rpm and the collection of steady state load-displacement attitude angle data at intermediate speeds up to and including 60,000 rpm. No sign of bearing whirl instability was detected. There was good correlation between theoretical and experimental data. Design data is included as a guide for future designs. (Author)

**AD-624 911** See Fld. 11/6

**AD-625 092** See Fld. 11/9

**AD-625 140** See Fld. 13/1

**AD-625 147** See Fld. 20/11

**AD-625 301** See Fld. 14/4

**AD-625 304** See Fld. 11/9

## 13/10. MARINE ENGINEERING

**AD-625 259 Fld. 13/10, 13/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL SUBMARINE MEDICAL CENTER GROTON CONN*
**LIGHTING SURVEY OF U.S.S. DOGFISH (SS350).**
Memo. rept.,
by S. M. Luria, and Donald O. Weitzman. 26 Nov 65, 8p. Rept. no. mr-65-14
NAVMED MF022.03.03-9012.17
Unclassified report

Descriptors: (*Submarines, Lighting equipment), Tests

The reports contains the results of a survey of the lighting aboard the USS DOGFISH (SS350) to determine the adequacy of existing illumination. The findings of this lighting survey indicate that the level of illumination in many areas fails to meet suggested standards. Specific recommendations are made for improvement.

**AD-625 321 Fld. 13/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF*
**LOCOMOTION OF OCEAN BOTTOM VEHICLE BY SHIFTING BALLAST.**
Technical note,
by Charles L. Herndon. 10 Dec 65, 19p. Rept. no. TN-N-752
Proj. NCEL-Y-R011-01-01-083
Unclassified report

Descriptors: (*Underwater propulsion, Ocean bottom), (*Ballast, Underwater propulsion), Motion, Ships, Vehicles, Feasibility studies, Ocean bottom topography, Roll, Oceanographic vessels, Power, Vehicle wheels, Thrust, Deep submergence

The report describes a feasibility study of shifting ballast in a rolling unit as a means of locomotion for deep ocean vehicles over terrain likely to be encountered on the ocean floor. It was determined that this was not a practical approach at the present time, because of excessive power requirements. To move the vehicle one mile per hour requires 20.5 HP, which increases to 73 HP to move it two miles per hour. (Author)

**AD-625 327 Fld. 13/10, 20/4**
**CFSTI Prices: HC $4.00 MF $1.00**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB*
**WAKE ANALYSIS OF SHIP MODELS; SINGLE-SCREW MERCHANT-TYPE,**
by Henry M. Cheng, and Jacques B. Hadler. Nov 65, 125p. Task S-R011-01-01
DTMB 2076
Unclassified report

See also AD-09 595.

Descriptors: (*Ship models, Wake), (*Wake, Mathematical analysis), (*Merchant vessels, Wake), Propellers (Marine), Velocity, Digital computers, Cavitation

The report presents the results of the analysis of the wake of single-screw merchant ship models and several naval auxiliaries. The data presented are the interpolated longitudinal and tangential velocity distributions, their computed mean values, the harmonic contents of these velocity components, the maximum variations in the resultant inflow velocity, and the advance angles and their variations. Also included are the calculated volumetric wake velocities. An IBM 7090 computer was used for data processing. (Author)

**AD-625 339 Fld. 13/10, 20/11**
**CFSTI Prices: HC $2.00 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB*
**INVESTIGATION OF SELF-EXCITED PLANING VIBRATION AT LARGE WETTED ASPECT RATIO.**
Final rept.,
by Elmo J. Mottard. Nov 65, 33p. Proj. S-R011 01 01 Task 0401
DTMB 2017
Unclassified report

Descriptors: (*Planing surfaces, Vibration), Aspect ratio, Turbulence, Hydrodynamics, Stability, Hydrodynamic configurations, Flutter, Oscillation

The effects of beam, sweepback, trim, load, speed, natural frequency, and vibrational direction on the incipience of vibration of planing surfaces with large wetted aspect ratio were investigated. Experimental results are presented in nondimensional form and correlated with results from a semi-empirical analysis. These results lead to the conclusion that the vibration under study was a dynamic instability involving an induced rise of the water surface ahead of the planing surface. Based on the results of the study, means of alleviating the vibration are suggested. (Author)

**AD-625 385 Fld. 13/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*CONESCO INC CAMBRIDGE MASS*
**SHIP HULL VIBRATIONS - 9: A GUIDE FOR DESIGN STAGE CALCULATIONS OF PROPELLAR EXCITED VIBRATIONS,**
by R. T. Bradshaw. Dec 65, 79p. Rept. no. conesco-4841-1
Contract NObs-92237
Unclassified report

Descriptors: (*Ship hulls, Vibration), (*Propellers (Marine), Vibration), Pressure, Design, Handbooks, Wake, Loading (Mechanics), Mathematical analysis

The guide is intended for the design engineer who is faced with the problem of estimating the vibratory response of a ship's hull to excitations originating at the propeller. A number of methods for calculating the forces and moments associated with propeller action are presented and methods for computing hull amplitudes are described. The methods selected are intended to be complementary, the simpler ones being appropriate in the early design stages or whenever few details are known, while the more elaborate methods are appropriate when full information on hull structure, propeller particulars, and wake characteristics are available. As far as possible, the procedures were adapted for use with slide rule or desk calculator, however, in a few instances machine calculation is essential. In view of this a summary of computing equipment available at the various naval shipyards is included.

**AD-625 510 Fld. 13/10**
**CFSTI Prices: HC $4.00 MF $0.75**
*BUREAU OF SHIPS WASHINGTON D C*
**FROM OARS TO THE WATER-JET,**
by I. A. Luchanskii, and A. A. Yanovskii. Nov 65, 119p. Rept. no. 959
TT 66-60091
Unclassified report

Trans. of mono. Ot Vesla do Vodometa, Leningrad, 1964 p81-206.

Descriptors: (*Propellers (Marine), Reviews), Pitch (Motion), Jets, USSR, Hydrojet engines, Impellers

Contents: Screw propellers, Controllable pitch propellers, Impeller-type (Voith-Schneider) propellers, Water-jet and hydroreactive propellers.

**AD-625 530 Fld. 13/10, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERO-ELECTRONIC TECHNOLOGY DEPT*
**A FORCE BALANCE ANALOG FOR DETERMINING CHARACTERISTICS OF OCEAN CABLE SYSTEMS.**
Phase rept.,
by John R. Dale. 16 Nov 65, 28p. Rept. no. nadc-AE-6517
Task RUDC2B000/2021/W210-1X-00
Unclassified report

Descriptors: (*Cables (Mechanical), Mooring), (*Analog systems, Cables (Mechanical)), Force (Mechanics), Statics, Simulation, Hydrodynamics

A force balance analog is a new tool for solving any flexible cable system problem that can be instantaneously represented by a balance of static forces. The analog is capable of reproducing computer program solutions to within =5 percent for cable tensions and physical geometry. The force balance analog is simply a vertical board display of a simulated nonconcurrent, coplanar force system with reduced force and geometric scales. Assumptions are developed for the analog based on a classical static analysis of a free rigid body system. Design features of the analog are described, and design criteria is presented for choosing realistic vertical ocean velocity profiles simulating surface and abyssal circulations, and cable parameters. (Author)

**AD-625 614 Fld. 13/10, 13/11**
**CFSTI Prices: HC $3.00 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**PLASTIC MARINE FITTINGS,**
by G. M. Pazin, and B. I. Smirnov. 1965, 54p. Rept. no. translation-2037
TT 66-60103
Unclassified report

Trans. of extracts unidentified mono. pub. Leningrad, 1965 240p.

Descriptors: (*Plastics, Marine engineering), (*Marine engineering, Plastics), (*Ship structural components, Plastics), (*Fittings, Plastics), USSR, Watertight doors, Glass textiles, Polyester plastics, Polyamide plastics, Nylon, Physical properties

**AD-625 099 See Fld. 17/2**

**AD-625 262 See Fld. 5/5**

**AD-625 325 See Fld. 9/1**

**AD-625 374 See Fld. 11/6**

**AD-625 478 See Fld. 10/2**

## 13/10.1 SUBMARINE ENGINEERING

**AD-624 896 See Fld. 11/3**

## 13/11. PUMPS, FILTERS, PIPES, TUBING AND VALVES

**AD-625 120 Fld. 13/11, 14/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**PRESSURE BURSTS IN BAKEABLE ULTRA-HIGH VACUUM VALVES DURING OPENING AND CLOSING.**
Technical rept.,
by Rudolf G. Buser, and John J. Sullivan. Sep 65, 22p. Rept. no. ecom-2638
Proj. DA-1P0-14501-B11A Task 1P0-14501-B11A-00,1P0-14501-B11A-34-00-34
Unclassified report

Descriptors: (*High vacuum valves, Operation), Vacuum, Pressure, Measurement, Impurities, Spectrum analyzers, Gases

The pressure increase delta p produced by opening and closing bakeable ultrahigh vacuum valves of different commercial sources has been determined using mass spectrometric and other standard techniques. Typical results show: (1) Dependence of delta p on geometry and material of bellow seat and gasket and their previous treatment. (2) Delta p (Bellows; gasket closing, opening) approaches after initial operation a constant value. (3) Delta p (closing) < Delta p (opening for the gasket). (4) Delta p (closing) same order of magnitude as Delta p (opening for the bellows). (5) Pressure bursts correspond in most cases to an equivalent increase of the partial pressure of H2. (6) Delta p (bellows) shows weak dependence on background pressure, delta p (gasket) is pressure independent. Results are applied to a mass spectrometric sampling method. It is shown that the introduction of bakeable valves into the system may be the limiting factor of the experiment, and otherwise ideal conditions will permit measurement of impurity ratios, e.g. for H2 in He in the order of 1/10 to the 7th power at best. (Author)

**AD-625 141 Fld. 13/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**MOUNTING DEVICE FOR CAISSON PUMPS,**
by L. S. Arinushkin, A. Yu. Polinovskii, V. B. Zansokhov, and I. M. Nosotsov. 15 Nov 65, 6p. Rept. no. ftd-TT-65-1013
TT 66-60002
Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 247, appl. no. 869826/40-23, 13 Dec 63.

Descriptors: (*Pumps, Installation), USSR, Patents, Tanks (Containers), Hermetic seals, Recovery

The object of the invention is a mounting device for caisson pumps containing a body with windows arranged around the perimeter. To assure the setting up and taking out of the pumps without the draining of the fuel from the tanks it is provided with a cylindrical covering with windows which are made in form and dimensions identically like the windows in the body and with a toothed segment connected with a pinion which can be made to turn by an extended out rod. (Author)

**AD-625 291 Fld. 13/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**RESULTS OF TESTING THE STAGES OF CENTRIFUGAL PUMPS WITH VARIOUS FLOW TWISTS AT THE INPUT INTO THE WHEEL,**
by V. M. Shlindman. 1 Dec 65, 17p. Rept. no. ftd-TT-65-1027
TT 66-60069
Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) n11 p14-7 1964.

Descriptors: (*Centrifugal pumps, Tests), USSR, Fluid flow, Mathematical analysis, Turbulence, Twist (Aerodynamics), Angle of attack

Results are given of analyzing experimental characteristics on the basis of determining the input circulation by the difference of stage pressures during the work with and without stream twist in front of the wheel. (Author)

**AD-625 320 Fld. 13/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF*
**ICE CONSTRUCTION-PROTOTYPE SUBMERSIBLE ELECTRIC PUMP AND EXTENSION TUBE.**
Technical note,
by C. R. Hoffman. Oct 65, 17p. Rept. no. tn-N-727
Proj. NCEL-Y-F015-11-01-073
Unclassified report

Descriptors: (*Pumps, Underwater equipment), Tests, Sea water, Heat elements, Electric motors, Thermal insulation, Expanded plastics, Polar regions, Ice

Sea ice has been used extensively in polar regions for roads, runways, camp sites and other operational purposes. It has been found, through field experiments, that free flooding ice at subfreezing temperatures is an effective method of improving the surface and load bearing capacity of natural ice sheets. In this technique, water is pumped from below the ice, discharged around the pump, and allowed to seek its own level. The successful performance of an experimental submersible electric pump in this application at Thule, Greenland, led to the design and fabrication of a prototype casing and extension tube for high-volume, low-lift pumps. Functional testing of a 1,600-gpm, 12-foot-head prototype in the Port Hueneme harbor indicated that it should be well suited for flooding natural ice surfaces from 1 to 30 feet or more in thickness. Following correction of the corrosion and electrical connection problems encountered in the Hueneme tests, the unit will be tested in a polar environment. (Author)

**AD-625 402 See Fld. 13/13**

**AD-625 614 See Fld. 13/10**

## 13/12. SAFETY ENGINEERING

**AD-625 040 Fld. 13/12, 18/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*LIN (T Y) AND ASSOCIATES VAN NUYS CALIF.*
**BLAST AND IMPACT EXPOSURE OF EXISTING STRUCTURAL FIRE PROTECTION SCHEMES.**
Final rept.,
by I. R. Stubbs. Jun 65, 34p. Rept. no. 64249
Contract OCD-PS-65-7 Task 1157C
Unclassified report

Descriptors: (*Fire safety, Structures), (*Nuclear explosion damage, Fire safety), Blast, Impact shock, Debris, Buildings, Fire-resistant materials, Beams (Structural), Supports, Floors, Walls, Roofs

A study was made of existing structural fire protection schemes with respect to their ability to withstand blast and impact from blast produced missiles. The study is divided into three parts. The first deals with an evaluation of the state of the art of fire prevention and the accepted concepts of rating communities and structures for potential fire damage. A method arranging structural fire protection schemes into categories, according to the general blast and impact exposure characteristics, is presented together with a suggested tabular form. Next is a review of recent research in the fire resistance of materials and assemblies considering the effects of blast and impact exposure. The third part recommends what might be done to advance our present knowledge on the subject. (Author)

**AD-625 173 Fld. 13/12, 19/4**
**CFSTI Prices: HC $5.00 MF $1.25**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**SECONDARY IGNITIONS IN NUCLEAR ATTACK.**
Final rept.,
by John McAuliffe, and Kendall Moll. Jul 65, 198p. Contract N228 (62479)65701 Proj. SRI-5106
Unclassified report

Descriptors: (*Fires, Nuclear warfare), (*Explosion effects, Fires), Hazards, Civil defense systems, Sources, Ignition, Electrical equipment, Heaters, Structures

The civil defense study analyzes secondary fires (i.e., fires caused by blast and other nonthermal effects) and other fires caused by disruptions to normal activities because of attack. Secondary ignition frequencies are estimated at .006 per 1,000 sq ft of total floor area damaged by at least 2 psi blast pressure. This estimate is consistent with available data from atomic and conventional bombings, explosive disasters, and earthquake and tornado experiences. The estimate implies that secondary ignitions can be the major cause of nuclear fires. The study resolves existing contradictory conclusions from Hiroshima and Nagasaki on the basis of known physical effects. It shows from statistical analyses that the most hazardous structures are wooden ones; the most hazardous fire sources are electrical and heating equipment; and the most hazardous occupancies are storage of high-energy materials such as oil and chemicals. It attributes secondary ignitions mainly to the rupture of fuel lines and containers by flying debris and collapsing structures. The study also concludes that fires during warning and postattack recovery periods are not potentially critical civil defense problems. However, hazards from such fires, as well as from nuclear- and disaster- caused fires, can be greatly reduced by cutting off electricity and other energy supplies. (Author)

## 13/13. STRUCTURAL ENGINEERING

**AD-625 113 Fld. 13/13, 8/13**
*RENSSELAER POLYTECHNIC INST TROY N Y*
**CONSOLIDATION DUE TO TANGENTIAL LOADS (CONSOLIDATION PRODUITE PAR DES CHARGES TANGENTIELLES),**
by R. L. Schiffman, and A. A. Fungaroli. 1965, 7p.
Unclassified report

*Availability: Published in Proceedings of the International Conference on Soil Mechanics and Foundation Engineering (16th), p188-91 1965. Copies to DDC users only.*

Descriptors: (*Foundations (Structures), Loading (Mechanics)), (*Compressive properties, Foundations (Structures)), Soil mechanics, Porosity, Stresses, Deformation, Shear stresses, Integral transforms

The consolidation is studied of a semi-infinite solid when a uniform tangential load is applied to the surface. The theory for a tangential surface load is developed in terms of three displacement functions. Relationships between stresses, displacements, excess pore pressure, and the displacement functions are given. The problem of a unit tangential load uniformly distributed over a circular area is solved, by Hankel-Laplace transform techniques. The excess pore pressures at a point are analysed for a pervious and an impervious surface. (Author)

**AD-625 238 Fld. 13/13**
**CFSTI Prices: HC $3.00 MF $0.50**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**THE POTENTIAL OF MASS PRODUCTION FOR REDUCING COSTS IN SHELTER CONSTRUCTION, A PRELIMINARY SURVEY.**
Progress rept.,
by Charles D. Bigelow. Mar 65, 55p. Contract OCD-PS-64-201 Proj. SRI-MU-4949-021
Unclassified report

Descriptors: (*Shelters, Construction), (*Construction, Costs), Production, Buildings, Design, Engineering, Concrete, Labor

The report presents the results of a survey, the object of which was a preliminary determination of the potential of mass production for lowering shelter costs. All cost items necessary to a comparison of mass production versus conventional techniques in building are identified. These cost items, for a conventionally built shelter, are arrayed for identification of those for which significant savings through mass production are possible. Selected items whose cost may be reduced through the use of massproduction techniques are reviewed and savings estimated. The direction of future research, to quantify the savings identified in the preliminary survey, is outlined. (Author)

**AD-625 402 Fld. 13/13, 13/11, 15/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF*
**COLLECTIVE PROTECTOR DESIGN AND DEVELOPMENT.**
Technical note,
by N. P. Oldson, and R. J. Zablodil. Nov 65, 22p. Rept. no. tn-N-783
Proj. Y-F011-08-03-326
Unclassified report

Descriptors: (*Air intake filters, Shelters), Ventilation, Radiological contamination, Biological warfare agents, Chemical warfare agents, Charcoal, Paper, Gases, Absorption, Fire-resistant materials, Blowers, Airburst, Feasibility studies, Civil defense systems

Filtration of ventilation air is necessary to protect personnel in a shelter area against radiological, biological, and chemical warfare agents. A 'collective protector' unit includes three filters, in series with a blower, which will remove contamination from the ventilating air entering the shelter. The objective of this work unit is to develop a family of modern, lightweight collective protector units, which will incorporate easy replacement of filter elements, and easy interchange of power units. In this connection, various filtering media were to be investigated to determine the feasibility of using some of the new concepts of air filtering. The

results of the study of filtering media were reported in reference 2. Activated charcoal and pleated paper were determined to be the most feasible and economical media for removal of gas and particulate matter respectively. The M9A1 collective protector (presently used) weighs 637 pounds. The charcoal filter, fan assembly, skids and supports, and inlet plenum, were selected as areas where substantial weight reduction could be realized. A charcoal filter weighing 185 pounds (as compared to 318 pounds for M9A1) was developed, and will be tested for gas absorption and fire resistance. Prefilter and particulate filter elements were subjected to low blast overpressures. With reinforcement the limit of over-pressure for the prefilters was determined to be 2.8 psi. The blower drive was arranged to enable the electric motor to be replaced with a gasoline engine, and a damper for close control of airflow has been developed. Plans of the 600 cfm prototype unit are near completion. (Author)

**AD-624 892 See Fld. 8/13**

**AD-625 255 See Fld. 11/5**

**AD-625 332 See Fld. 1/3**

**AD-625 436 See Fld. 13/1**

**AD-625 443 See Fld. 8/13**

## 14/1. COST EFFECTIVENESS

**AD-625 472 See Fld. 5/1**

**AD-625 659 See Fld. 19/1**

## 14/2. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

**AD-624 888 Fld. 14/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*CORNELL AERONAUTICAL LAB INC BUFFALO N Y*
**A PROBE FOR THE MEASUREMENT OF HIGH SURFACE TEMPERATURES,**
by Gerald A. Sterbutzel. Sep 65, 62p. Contract AF33 (615)-1485 Proj. AF-1347 Task 134702
AFFDL TR-65-121
Unclassified report

Descriptors: (*Thermocouple pyrometers, Surface temperatures), (*Surface temperatures, Thermocouple pyrometers), High-temperature research, Surfaces, Measurement, Calibration, Thermoelectricity

The report describes the design, operation and performance of a probe system with which temperatures can be measured quickly and accurately on a variety of surfaces. In operation the probe is touched to the surface and through its own sensor, heater and electronic servo system is automatically adjusted to the undistorted surface temperature. Extensive testing on a variety of materials (including alumina, stainless steel, titanium, Rene 41, disil coated molybdenum, disil coated columbium, zirconium, and quartz) has shown it generally to have an accuracy of better than 1/2%. The highest temperature measured successfully in intermittent steady state tests was about 2450F (1343C) and in transient tests was 2994F (1645C). (Author)

**AD-624 923 Fld. 14/2**
**CFSTI Prices: HC $7.00 MF $1.75**
*NAVAL BOILER AND TURBINE LAB PHILADELPHIA PA*
**INSTRUMENT STANDARDS.**
12TH ED.,
by E. L. Lewis. 1 Jul 65, 341p.
Unclassified report

Descriptors: (*Instrumentation, Standards), (*Naval research laboratories, Instrumentation), Boilers, Turbines, Meters, Thermocouples, Materials, Specifications, Measurement, Calorimeters, Flowmeters, Manometers, Pipes

The Standard Plans contained in this binder constitute Naval Boiler and Turbine Laboratory Instrument Practice as of the Date of Issue. They represent only repetitive items, each test measurement system is designed according to its own requirements, the standards being used where applicable. The Standards specifically concerned with Flow Measurement have been removed from this volume and are being issued as a separate publication. The assembly of these standards into a separate volume has been done to facilitate their use by those whole primary area of interest is in the field of fluid flow measurement and calculation. (Author)

**AD-624 926 Fld. 14/2, 20/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEFENSE RESEARCH LAB UNIV OF TEXAS AUSTIN*
**A STANDARDIZED TRANSDUCER CALIBRATION SYSTEM FOR NAVAL SHIPYARD TRANSDUCER REPAIR FACILITIES,**
by D. D. Baker, J. E. Stockton, and J. W. Whiteley. 7 Dec 65, 41p. Rept. no. drl-A-250
Contract NObsr-93125 Proj. SF0010318 Task 8048
Unclassified report

Descriptors: (*Transducers, Calibration), (*Calibration, Transducers), (*Maintenance equipment, Calibration), Standardization, Underwater sound equipment, Naval equipment, Test facilities, Costs, Test methods, Test equipment, Instrumentation, Naval shore establishments

The report describes in detail the necessary testing capabilities, the necessary instrumentation, and the general testing procedures. A detailed list of specifications for the system is presented. The system is designed for farfield measurements but is compatible with nearfield techniques. An itimized approximate price list is included for planning purposes. It is recommended that at least four 'turn key' systems of the specified design be purchased for the shipyard transducer repair facilities. It is further recommended that all other related requirements of these facilities be improved to a point commensurate with the calibration system, and that work begin on outlining standardized testing procedures for the facilities. (Author)

**AD-624 954 Fld. 14/2, 20/2, 7/4**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)*
**APPARATUS FOR MEASUREMENT OF THE LUMINESCENCE SPECTRA OF CRYSTALS AT N.R.C. OTTAWA,**
by F. R. Lipsett. 1965, 9p. Rept. no. nrc-7880
Unclassified report

Presented at Moscow, Kiev and Leningrad during Apr-May, 1963.

*Availability: Published in Photoelectric Spectrometry Group Bulletin no. 16 pl-9 1965. Copies to DDC users only.*

Descriptors: (*Spectrum analyzers, Crystals), (*Crystals, Luminescence), Cryostats, Photomultipliers, Corrections, Experimental data, Analog-to-digital converters, Canada

**AD-624 976 Fld. 14/2**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED PHYSICS*
**ATOMIC TRANSITION SETS CANADA'S TIME,**
by A. G. Mungall, R. Bailey, and H. Daams. 1965, 6p. NRC 8696
Unclassified report

*Availability: Published in Canadian Electronics Engineering Aug 1965. Copies to DDC users only.*

Descriptors: (*Atomic clocks, Electron transitions), (*Molecular beams, Atomic clocks), (*Time, Standards), Cesium, Frequency, Atomic energy levels, Canada

**AD-625 012 Fld. 14/2**
*AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO*
**THEORETICAL ERROR OF THE AUTOMATIC SOUND DERIVATIVE DEVICE.**
Technical rept.,
by S. M. Call. 20 Jan 65, 4p. Rept. no. AFAL-TR-65-251
Unclassified report

*Availability: Published in Review of Scientific Instruments v36 n6 p850-2 Jun 1965. Copies to DDC users only.*

Descriptors: (*Langmuir probes, Errors), Electric currents, Voltage

Fourier's theorem is applied in deriving the second harmonic amplitude of the current in the device for taking the second derivative of the current-voltage characteristic of a Langmuir probe in a plasma.

**AD-625 020 Fld. 14/2, 9/1, 20/5**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**SIMPLE APPARATUS FOR APPLYING UNIAXIAL PRESSURE AT VERY LOW TEMPERATURES,**
by J. H. R. Ward. 26 Apr 65, 2p. Rept. no. JA-2590
Contract AF19 (628)-5167 ESD TDR-65-502
Unclassified report

*Availability: Published in Scientific Instruments v36 n9 p1376-7 Sep 1965. Copies to DDC users only.*

Descriptors: (*Instrumentation, Diodes (Semiconductor)), (*Diodes (Semiconductor), Stresses), (*Lasers, Diodes (Semiconductor)), Pressure, Low-pressure research, Vacuum, Lead alloys, Selenium alloys, Tellurium alloys

The note describes an apparatus used in applying uniaxial stress to PbSe and PbTe laser diodes operating at temperatures near 4.2K. The diode under stress is mounted in vacuum on a conduction-cooled cold finger which extends from a liquid helium reservoir. Laser radiation is transmitted through the salt window mounted on the outer shell of the Dewar. The apparatus was designed so a known pressure could be applied to a sample which is both in a vacuum and at a temperature near 4.2K.

**AD-625 064 Fld. 14/2, 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**TOTAL PRESSURE PROBE FOR A SUPERSONIC GAS FLOW WITH A SLIGHTLY NONUNIFORM VELOCITY FIELD,**
by M. P. Ryabokon. 8 Dec 65, 6p. Rept. no.
FTD-TT-65-1130
TT 65-64848
Unclassified report

Unedited rough draft trans. of Patent (USSR) 165 328, appl. no. 823324/26-10, 4 Mar 63.

Descriptors: (*Supersonic flow, Pressure gages), (*Pressure gages, Supersonic flow), Axially symmetric flow, Patents, USSR

The object of the invention is a probe of the full pressure in a supersonic flow of a gas with a slightly nonuniform field of velocities representing an axisymmetrical body with pressure-taking tubes. For the purpose of improving the precision of the measure of the full pressure, the contour of the

body is designed in the form of an eccentric surface which checks the flow (retarding it) from the supersonic down to the transonic velocity, and the proble tubes are located at the end of the zone of retardation. (Author)

**AD-625 083 Fld. 14/2, 20/13**
*ALBERTA UNIV CALGARY DEPT OF PHYSICS*
**AN ELECTROMECHANICAL VERSION OF THE IGY RIOMETER,**
by H. A. Buckmaster. 30 Apr 65, 6p. Contract DRB-2801-16

Unclassified report

*Availability: Published in Canadian Journal of Physics v43 p1678-82 1965. Copies to DDC users only.*

Descriptors: (*Recording systems, Ionospheric propagation), (*Radio waves, Absorption), Canada, Radiometers, Measurement, Demodulators, Diodes (Semiconductor), Electronic switches

The report describes a variation of the former type of riometer, which features an electromechanical synchronous demodulator, the use of a shaft-position encoder, and a diode switch with a high channel isolation factor. These features permit the reliable detection of changes in absorption of 0.01 dB even in the presence of strong interference, since the system is inherently minimal unless the amplifiers are blocked because there is no integration of noise bursts in a mechanical synchronous demodulator. This demodulator responds to interference which is synchronous with the switching frequency for an interval longer than the time constant of the motor. It does not suffer from zero-baseline drifts due to asymmetric aging of the diodes and other components in electronic synchronous demodulators.

**AD-625 090 Fld. 14/2, 20/5, 9/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**SCIENCE BULLETIN (SELECTED ARTICLES).**
25 Oct 65, 19p. Rept. no. ftd-TT-65-751
TT 65-64861

Unclassified report

Edited trans. of K'o Hsueh T'ung Pao (Chinese People's Republic) n8 p733-6, 737-9 1964.

Descriptors: (*Lasers, Scientific research), (*Signal-tonoise ratio, Electromagnetic pulses), Mirrors, Shutters (Optics), Data processing systems, Test methods, China, Ruby, Sampling

Contents: An instantaneous high power ruby laser; Analysis and experiments in increasing signal-to-noise ratio in the data sampling process.

**AD-625 118 Fld. 14/2, 9/6, 17/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*PACIFIC MISSILE RANGE POINT MUGU CALIF*
**PERFORMANCE OF THE AN/GMD-2 RAWIN SET IN THE DENPRO SYSTEM.**
Technical memo.,
by R. A. Wallston. 1 Dec 65, 21p. Rept. no. pmr-TM-65-2

Unclassified report

Descriptors: (*Sounding rockets, Tracking), (*Radiosondes, Tracking), Data processing systems, Performance (Engineering), Velocity, Altitude, Data

An analysis is performed of the velocity and altitude data derived from the AN/GMD-2 rawin set track of four flights of the density probe (DENPRO) vehicle. Data from AN/FPS-16 radars are available for two of the flights and are used as a basis for evaluating the AN/GMD-2 data. Slant ranges and vehicle velocities derived from the AN/GMD-2 compare favorably with those derived from the AN/FPS-16 data. Vehicle altitudes derived from the AN/GMD-2 are consistently lower than those derived from the AN/FPS-16. This was due to AN/GMD-2 rawin-determined evaluation angles being lower than AN/FPS-16 radar-determined evaluation angles by varying amounts, though the reason for this has not yet been determined. It has been concluded (1) that the modified AN/GMD-2 is capable of tracking a rocket probe, (2) that AN/GMD-2 rawin-determined velocities may be expected to be within 1 per cent of AN/FPS-16 radar-determined velocities, and (3) that AN/GMD-2 rawin-determined altitudes are about 1 per cent lower than AN/FPS-16 radar-determined altitudes, up to an altitude of 400,000 feet. (Author)

**AD-625 132 Fld. 14/2, 3/2**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB*
**AN ATTEMPT TO REDUCE THE GAS LOAD IN AN ULTRAHIGH-VACUUM CHAMBER.**
Interim rept.,
by Joel E. M. Adler. 23 Nov 64, 9p. Rept. no. instrumentation Papers-84
Proj. AF-8602 Task 860201
AFCRL 65-743

Unclassified report

*Availability: Published in Journal of Vacuum Science and Technology v2 n4 p209-10 Jul-Aug 1965. Copies to DDC users only.*

Descriptors: (*Luner environment, Simulation), (*Vacuum apparatus, Laboratory equipment), (*Laboratory equipment, Space environmental conditions), Gases, Leakage (Fluid), Flanges, Diffusion pumps, Vacuum seals, Contamination, O-rings, Performance (Engineering), Oils, Vacuum, Low-pressure research, Controlled atmospheres

The Ilikon ultrahigh vacuum chamber has been equipped to simulate the conditions of the lunar surface, including temperature, pressure of 10 to the minus 10th power torr, and radiation. It is used in a program to determine the effect of such conditions on the physical properties of probable lunar surface materials. Several sources of gas load, flanges and seals, chamber walls, and backstreaming, has been examined. Recommendations for the reduction of these gas sources are given. (Author)

**AD-625 253 Fld. 14/2, 20/13, 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO*
**OBSERVED SUPERSATURATION IN THE ARL 20-INCH HYPERSONIC WIND TUNNEL.**
Technical rept.,
by Richard T. Goddard. Oct 65, 28p. Rept. no. arl-65-214
Proj. AF-7065 Task 706501

Unclassified report

Descriptors: (*Hypersonic wind tunnels, Condensation), (*Condensation, Air), Relaxation time, Nucleation, Water vapor, Stagnation point, Hypersonic nozzles

An experimental investigation of the condensation of air in a hypersonic wind tunnel was carried out. The experimental work was conducted in the ARL 20-inch hypersonic wind tunnel which utilizes a contoured nozzle to expand the flow to Mach 14 with stagnation temperatures up to 2100R at free stream Reynolds of 300,000 per foot to 1,000,000 per foot. Pitot probe surveys were made at the nozzle exit and at axial locations upstream of the nozzle exit. Surveys at the nozzle exit showed that the only indication of apparent condensation was a slight change in the slope of the pitot pressure versus free stream temperature curve. However, upstream surveys indicated a slight increase in pitot pressure at the critical temperature with the per cent of increase becoming greater at higher stagnation pressures. Therefore, it was concluded that the relaxation time (axial location) and the Reynolds number (variance of stagnation pressure) are the primary factors contributing to the pitot pressure sensitivity at the onset of condensation. The report also presents the experimentally determined operating regime of the ARL 20-inch hypersonic tunnel. (Author)

**AD-625 306 Fld. 14/2, 13/1**
*WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS*
**CONTAMINATION OF A LABORATORY BUILDING BY AIR FILTERS,**
by Max Blumer. Nov 65, 6p. Rept. no. whoi-Ref-65-58 ,WHOI-Contrib-1669
Contract Nonr-2196 (00) Grant ,NSF-GP-3250
Proj. NR-083-004

Unclassified report

*Availability: Published in Contamination Control v4 p13 Sep 1965. Copies to DDC users only.*

Descriptors: (*Chemical contamination, Laboratories), (*Air pollution, Laboratories), (*Clean rooms, Air pollution), (*Cooling + ventilating equipment, Contamination), Air intake filters, Impregnation, Phthalates, Esters, Solvents

Upon occupying a newly constructed laboratory, work was found to be affected by an unprecedented level of contamination in solvents, adsorbents and sea watersamples. The contamination was found to originate in plastic air filters, which were impregnated with high boiling phthalate esters to increase their tackiness. These esters evaporated, were carried into the laboratories, where they entered samples and reagents. (Author)

**AD-625 316 Fld. 14/2, 9/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*TEXAS INSTRUMENTS INC DALLAS*
**MICROELECTRONIC FREQUENCY AND TIME STANDARD.**
Final engineering rept. 1 Jul-5 Nov 65.
15 Nov 65, 32p. Rept. no. u5-807250-5
Contract NObsr-91352 Proj. SR0080303 Task 9624

Unclassified report

Descriptors: (*Subminiature electronic equipment, Time-interval counters), (*Frequency, Standards), (*Semiconductor devices, Frequency stabilizers), Timing devices, Crystal oscillators, Circuits, Power supplies, Amplifiers, Reliability (Electronics)

The microelectronic frequency and time standard was completed. Because of several problems encountered during assembly and testing, shipment of the final equipment was delayed until 5 November 1965. The major problems occurred with the power output stage of the distribution-amplifier modules. These problems were not resolved because of fund limitations, although the solution required was determined. The standard frequency oscillators and all other parts of the equipment met every design requirement except crosstalk and noise rejection. It is significant to note that the purposes of the contract (i.e., to use semiconductor networks to the greatest possible extent and to meet or exceed design requirements with those networks) were met. The circuits not meeting specifications either did not contain semiconductor networks or did not meet specifications because of other circuit components, configuration, or design philosphy. (Author)

**AD-625 354 Fld. 14/2, 4/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**SYMPOSIUM ON METEOROLOGICAL ROCKETS,**
by W. W. Kellogg. May 62, 20p. Rept. no. p-2580

Unclassified report

Presented at the COSPAR International Symposium (3rd), Washington, D. C., 25 Apr 62.

Descriptors: (*Sounding rockets, Meteorology), (*Atmospheric sounding, Symposia), Meteorological instruments, Upper atmosphere

**AD-625 405 Fld. 14/2, 20/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO*
**AERODYNAMIC PERFORMANCE OF REVERSED FLOW VORTEX CHAMBERS.**
Scientific rept.,
by Robert Poplawski, and Alfred Pinchak. Oct 65. 82p. Rept. no. arl-65-219
Proj. 7116
Unclassified report

Descriptors: (*Secondary flow, Vortices), (*Hilsch tubes, Performance (Engineering)), (*Vortex generators, Aerodynamics), Injection, Experimental data, Optimization, Compressible flow, Supersonic flow, Incompressible flow

This work presents recent experimental results obtained with unconventional vortex tubes. Experiments were conducted in both the compressible, supersonic and incompressible flow regimes. By proper injection of the fluid a reversed secondary flow pattern is obtained which enhances particle or gas separation processes. The aerodynamic performance of these new vortex or swirl chambers is compared with the data of other investigators employing conventional vortex chambers. A detailed account of the experimental procedures, both successful and unsuccessful, is also included. Secondary flows in both conventional and in the aforementioned swirl chambers are discussed in some detail. Consideration is also given to the factors limiting the maximum rotational velocities obtainable in vortex tubes.

**AD-625 543 Fld. 14/2, 13/8**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO*
**THE EVOLUTION OF USAF ENVIRONMENTAL TESTING.**
Technical rept.,
by Virgil J. Junker. Oct 65, 83p. Rept. no. affdl-TR-65-197
Proj. AF-1370 Task 137010
Unclassified report

Descriptors: (*Environmental tests, Air Force research), (*Air Force equipment, Environmental tests), Test methods, Low altitude, High-temperature research, Low-temperature research, Thermal stresses, Fungus deterioration, Space environment conditions, Shock (Mechanics), Leakage (Fluid), Acceleration, Vibration, Noise, Standards

This report presents supporting data and background information on the origination and development of natural and induced environmental tests intended for USAF aerospace and ground equipment. The information provided in the discussion portion of the test writeups is intended to give the designer, application engineer, and those individuals responsible for specifying test requirements a clearer understanding of the interpretation, application, and relationship of tests as called out in various environmental test documents. The growth of environmental criteria and test procedures is traced from the first Army Air Force specification No. 41065 dated 7 December 1945 to MIL-STD-810A (USAF) dated 23 Jun 1964. Included also in this report are discussions on environmental test specifications MIL-T-5422, MIL-E5272, and MIL-E-4970. (Author)

**AD-625 565 Fld. 14/2**
*GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y RESEARCH DEPT*
**CHAMBER FOR CONTINUOUS MIXING OF HIGH PRESSURE COMBUSTIBLE GASES,**
by Richard A. Oman, and Jarvis Long. 3 Feb 64, 5p. Rept. no. rm-244J
Unclassified report

*Availability: Published in The Review of Scientific Instruments v35 n7 p861-2 Jul 1964. Copies to DDC users only.*

Descriptors: (*Gases, Diffusers), (*Diffusers, Design), Hazards, Handling, Mixtures, Shock tubes, Hypersonic flow, Combustion chambers

A small mixing chamber has been developed for continuous mixing of combustible gases for use in the combustion driver of a hypersonic shock tunnel. The gases are mixed while passing through the chamber and then flow directly into the shock tunnel driver tube. The system ensures immediate uniform mixing of the gases. It eliminates all waiting time needed to allow the gases to mix by diffusion (often several hours), as well as the hazard of storing combustible mixtures. It also eliminates the need for distributed injection locations and their associated hardware. The concept is applicable to many gas mixtures and has been used at Grumman to generate stoichiometric mixtures of H2 and O2, diluted with 80% He, at pressures up to 3200 psi. (Author)

**AD-625 601 Fld. 14/2, 13/2**
**CFSTI PricesMF $0.50**
*ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS*
**AERIAL PENETROMETER DEMONSTRATION AT FORT RUCKER, ALABAMA,**
by A. A. Rula. Jan 59, 21p. Rept. no. miscellaneous Paper-4-300
Unclassified report

See also PB-136 129, PB-136 140.

*Availability: Hard copy available from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss. $0.50.*

Descriptors: (*Soil mechanics, Test equipment), (*Soils, Penetration), (*Trafficability, Test methods)

Conclusions: (1) The aerial penetrometer can be used in reconnaissance to estimate the ability of coarse-grained soils to support vehicles or aircraft. The demonstration also showed that the penetrometer can be successfully launched from a gun. (2) The best penetration vs cone index correlation was obtained when the weighted average cone index for the depth of penetration was used. (3) The strength range of coarse-grained soil will usually be greater than that of fine-grained soil, and shear-pin type penetrometers will be required to measure these high strengths. (4) Additional work is needed to develop methods for selecting the proper material and wire diameter of shear pins, and also to field-test the method developed. (5) Additional data are required concerning coarse-grained soils containing a range of fines and of various moisture contents before valid penetrometer performancestrength relations can be established. (Author)

**AD-625 605 Fld. 14/2, 19/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB*
**IMPROVEMENT OF METHODS FOR MEASURING DETONATION RATES,**
by F. M. Galadzhii, V. N. Zenin, and B. I. Vainshtein. 23 Nov 65, 7p. Rept. no. tg-230-T461
Contract NOw-62-0604-c TT 66-60097
Unclassified report

Trans. of Vzryvnoe Delo (USSR) n52/9 p108-14 1963.

Descriptors: (*Detonation waves, Measurement), (*Oscillographs, Detonation waves), USSR

**AD-625 606 Fld. 14/2, 11/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*MATERIALS ADVISORY BOARD NAS-NRC WASHINGTON D C*
**EVALUATION TEST METHODS FOR REFRACTORY METAL SHEET MATERIALS.**
Nov 65, 50p. Rept. no. mab-216-M Superseded
Contract SD-118
Unclassified report

Descriptors: (*Test methods, Refractory metals), (*Refractory metals, Sheets), Mechanical properties, Structural properties, Welds, Thermal conductivity, Thermal expansion, Specific heat, Recrystallization, Physical properties, Tests

This is the third revision of recommended test methods for refractory metal sheet published by the Materials Advisory Board Refractory Metals Sheet Rolling Panel. The Panel's objective was to provide a standard basis for the test evaluation of sheet materials produced under various Department of Defense development programs. A subpanel was appointed for this purpose. After a thorough canvas of prominent suppliers and users of refractory sheet metals, the first recommendations were published in September 1961 as MAB-176-M to define common tensile, creep-rupture, bend, and thermal properties tests. Subsequently, as the Department of Defense programs progressed, more specialized tests became necessary to evaluate fabrication characteristics and to provide preliminary design data. Again, after discussion with principal organizations engaged in direct applications, a revised edition was published April 22, 1963, as MAB-192-M. Since that time, criticisms and comments have been reviewed by the subpanel with qualified individuals representing governmental and commercial laboratories. The present edition is based upon these reviews. Changes have been made in the tests described in Sections 1 through 6. The tests in Sections 7 through 15 are unchanged from Report 192-M. In preparing these recommendations, the subpanel has deferred where possible to prominent ASTM standards. (Author)

**AD-624 886 See Fld. 6/11**

**AD-625 042 See Fld. 17/7**

**AD-625 120 See Fld. 13/11**

**AD-625 140 See Fld. 13/1**

**AD-625 188 See Fld. 4/2**

**AD-625 335 See Fld. 4/2**

**AD-625 361 See Fld. 20/4**

**AD-625 388 See Fld. 4/2**

**AD-625 416 See Fld. 6/12**

**AD-625 421 See Fld. 20/2**

**AD-625 452 See Fld. 9/1**

**AD-625 491 See Fld.8/11**

**AD-625 530 See Fld. 13/10**

**AD-625 536 See Fld. 7/4**

**AD-625 555 See Fld. 8/11**

**AD-625 589 See Fld. 7/4**

**AD-625 607 See Fld. 8/11**

## 14/3. RECORDING DEVICES

**AD-625 199 See Fld. 17/10**

## 14/4. RELIABILITY

**AD-625 301 Fld. 14/4, 13/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**CALCULATING THE INTERDEPENDENCE OF MACHINE SUBASSEMBLIES IN DETERMINING RELIABILITY,**
by E. G. Volpert. 3 Dec 65, 8p. Rept. no. ftd-TT-65-1054
TT 66-60078
Unclassified report

Unedited rough draft trans. of Standartizatsiya (USSR) v28 n7 p14-6 1964.

Descriptors: (*Machines, Reliability), (*Reliability, Determination), Statistical analysis, Distribution functions, Probability, USSR

**AD-625 652 Fld. 14/4, 17/2**
*NORTHWESTERN UNIV EVANSTON ILL DEPT OF ELECTRICAL ENGINEERING*
**A NOTE ON THE RELIABILITY OF COMMUNICATION NETWORKS.**
Revised ed.,
by Y. Fu, and S. S. Yau. 29 Dec 61, 6p. Contract DA-ARO (D)-31-124-G223 AROD 3298:22
Unclassified report

Revision of manuscript submitted 11 Jan 61.

*Availability: Published in J. Soc. Indust. Appl. Math. v10 n3 p469-74 Sep 1962. Copies to DDC users only.*

Descriptors: (*Reliability (Electronics), Communication systems), (*Communication systems, Reliability (Electronics)), Probability, Graphics, Information theory

The reliability of a communication network is formulated in terms of the reliabilities of individual links and stations in the network. This is done by using a linear graph with both vertices and branches being weighted as the probabilistic model. In solving the reliability problem, we adopt the path approach. All possible paths between any two vertices in a linear graph are obtained by simplifying the linear graph. (Author)

## 14/5. REPROGRAPHY

**AD-625 029 See Fld. 5/2**

**AD-625 319 See Fld. 15/7**

## 15/1. ANTISUBMARINE WARFARE

**AD-624 893 See Fld. 5/3**

**AD-624 894 See Fld. 5/3**

## 15/2. CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE

**AD-625 615 Fld. 15/2, 6/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**DYNAMICS OF A BACTERIAL AEROSOL IN THE DUST AND DROP PHASE,**
by V. V. Vlodavets. Jun 65, 12p. Rept. no. translation-1389
TT 66-60104
Unclassified report

Trans. from Mikrobiologiya (USSR) v33 n1 1964.

Descriptors: (*Bacterial aerosols, Dynamics), (*Staphylococcus, Distribution), Dust, Drops, Humidity, USSR, Colloids

In a 250 liter experimental chamber, the dynamics were studied of an aerosol of Staphylococcus albus in the drop and dust phase. After dispersion of the bacterial suspension or bacterial dust, the concentration of the aerosol gradually decreased. Viable cells of staphylococci were exposed in the air still after 6-8 hours. Most suitable for the prolonged preservation of an aerosol of staphylococci in the air is dispersion of a bacterial suspension, prepared in distilled water, whereas an 0.85% solution of NaCl least of all promoted the lengthy preservation of staphylococci in the air. The dust phase of an aerosol is kinetically less stable than the drop phase, which is apparently connected with the colloidal properties of particles of bacterial dust, their size and hygroscopicity. A decrease in relative air humidity promotes an increase of the time of occurrence of staphylococci in the drop and dust phases of an aerosol. High humidity assists the settling down of bacterial drops as well as of particles of bacterial dust and the lowering of the concentration of the aerosol. (Author)

**AD-625 251 See Fld. 15/3**

**AD-625 435 See Fld. 6/15**

## 15/3. DEFENSE

**AD-624 870 Fld. 15/3**
**CFSTI Prices: HC $4.00 MF $0.75**
*DUNLAP AND ASSOCIATES INC DARIEN CONN*
**TRAINING REQUIREMENTS FOR POSTATTACK ADAPTIVE BEHAVIOR.**
Final rept.,
by Gilbert E. Teal, Ralph A. Fabrizio, Stanley M.Barnes, and William A. Moeller. Dec 65, 114p. Rept. no. ssd-65-245 (546)
Contract OCD-PS-65-33
Unclassified report

Descriptors: (*Civil defense systems, Training), Nuclear warfare, Survival, Fallout shelters, Behavior, Population, Education, Communication systems, Disasters, Motivation, Learning, Leadership, Management planning

The study is aimed at (1) identifying actions required of and beneficial to individuals in a post-attack environment and (2) developing guidelines concerning content and methods of training which would generate adaptive behavior. Methods of study were limited to literature review and scientific argument. Two major training objectives are specified: training to meet the requirements of individual survival; and of societal recovery. It is recommended that training materials be stocked in public shelters to support these objectives. Post-attack situations will require that such materials be readily available and used in conjunction with on-the-spot training, and the creation and communication of specific recovery plans for local communities. It is also recommended that certain information basic to education of the public in emergency measures be prepared for timely use in mass communication media at such times as crises or disasters provide the essential motivation to learn. It is suggested that training is the responsibility mainly of local community political authority; the effectiveness of training will depend heavily upon the degree to which such leadership has the knowledge and resources necessary to conduct this function. (Author)

**AD-624 929 Fld. 15/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**SWISS CIVIL DEFENSE.**
Final rept.,
by Arthur A. McGee. Nov 65, 50p. Contract OCD-OS-63-184 Proj. SRI-4559
Unclassified report

Descriptors: (*Civil defense systems, Switzerland), Command + control systems, Law, Management planning, Government (Foreign), Civil defense personnel, Training, Manpower studies, Armed forces (Foreign), Shelters

The report contains the results of the study of civil defense planning and preparation in the Swiss Federation. The study is primarily oriented toward defining operational organization, although policy, planning, and training organizations that have had a strong impact in promoting the growth of civil defense preparedness were also investigated. (Author)

**AD-625 172 Fld. 15/3, 13/2**
**CFSTI Prices: HC $6.00 MF $1.50**
*PLANNING RESEARCH CORP LOS ANGELES CALIF*
**THE ECONOMIC FEASIBILITY OF DECENTRALIZED METROPOLITAN REGIONS.**
Final rept.,
by H. R. Woltman, Barbara Woodfill, Keith Blunt, and James DeiRossi. 29 Oct 65, 296p. Rept. no. prc-D-796
Contract OCD-OS-62-278
Unclassified report

See also AD-426 925.

Descriptors: (*Civil defense systems, Urban areas), (*Urban planning, Economics), Feasibility studies, Costs, Population, Distribution, Density, Housing projects, Transportation, Passive defense

The preceding phase of this study examined the role of urban form as a passive defense variable and established criteria of spatial arrangement and density, which were designed to reduce metropolitan vulnerability to nuclear weapons. The resulting configuration consists of compact, discrete community units having populations of 100,000, separated from one another by 4 to 7 miles of open space, and grouped around a central or core unit. Services and facilities that are obtainable in a metropolitan area of several million are made available in this configuration by high intercommunity mobility. The study configuration is taken to be this 'ordered sprawl' urban pattern. The economic feasibility of this form of regional city is assessed. The focus is necessarily on costs, which are to some degree measurable, and although cost data directly pertinent to the idealization do not exist, it is possible to proceed inferentially by analyzing information derived from extant metropolitan areas. The primary approach is the specification of a 'reference region' that incorporates structural and linkage characteristics representative of existing urban areas, and the division of this region into components that approximate community units of the study configuration.

**AD-625 251 Fld. 15/3, 15/6, 15/2, 19/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**A SURVEY OF THE WEAPONS AND HAZARDS WHICH MAY FACE THE PEOPLE OF THE UNITED STATES IN WARTIME,**
by Harold L. Brode. Jun 65, 25p. Rept. no. p-3170
Unclassified report

Descriptors: (*Weapons, United States), (*Nuclear warfare, United States), (*Chemical warfare, United States), (*Biological warfare, United States), (*Defense systems, United States), High-explosive ammunition, Radiological warfare, Nuclear explosions, Blast, Thermal radiation, Cratering, Radioactive fallout

Contents: Non-nuclear weapons (conventional highexplosive weapons, biological warfare, chemical weapons). Special weapons (radiological weapons, neutron bomb, penetrating weapons, nuclear weapons). Nuclear explosions (initial character, nuclear radiation, uncertainties influencing attack

planning, height of burst). Blast damage. Thermal radiation from nuclear bursts. Ground shock and craters. Fallout, future weapon developments.

**AD-624 893** **See Fld. 5/3**

**AD-624 894** **See Fld. 5/3**

**AD-625 192** **See Fld. 5/9**

**AD-625 402** **See Fld. 13/13**

## 15/5. LOGISTICS

**AD-625 353 Fld. 15/5, 1/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**A MACRO ANALYSIS OF MILITARY AIR TRANSPORTATION,**
by W. A. Niskanen. 6 May 59, 10p. Rept. no. P-1690
Unclassified report

Descriptors: (*Air transportation, Operations research), (*Armed forces transportation, Air transportation), Armed forces supplies, Costs, Airplanes

Programming techniques are discussed for guidance in determining (1) the nature and magnitude of the major military airlift missions and (2) the best combination of airlift resources for performing these missions. A program was developed that selects the feasible set of airlift activities that meets a given set of mission requirements at a minimum total system cost; the total number of aircraft of a specific type in the minimum cost fleet must not exceed the sum of the beginning inventory plus the production availability.

## 15/6. NUCLEAR WARFARE

**AD-625 251** **See Fld. 15/3**

## 15/7. OPERATIONS, STRATEGY, AND TACTICS

**AD-625 135 Fld. 15/7, 12/2**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS DATA SCIENCES LAB*
**MINIMAX DETECTION STATION PLACEMENT.**
Physical sciences research papers,
by Richard D. Smallwood. 4 Sep 64, 25p. Rept. no. psrp-149
Proj. AF-5632 Task 563202
AFCRL 65-728
Unclassified report

*Availability: Published in Operations Research v13 n4 p632-46 Jul-Aug 1965. Copies to DDC users only.*

Descriptors: (*Detection, Military facilities), (*Military facilities, Distribution), (*Mathematical models, Minimax technique), Operations research, Military strategy

A model for the placement of n detection stations for optimum coverage of an arbitrary plane area is described. The stations are assumed to be identical and to have a probability of detection that is a function only of the distance between the station and the event to be detected. Furthermore, the stations are assumed to operate independently of each other. It is also assumed that the enemy has complete knowledge of the station locations and the effectiveness and is interested only in eluding detection by the detection stations. Thus, the situation is reduced to the minimax problem of placing the stations minimized. A hill climbing iterative technique for finding the optimum locations is described in some detail. This technique is illustrated for the problem of locating detection stations within the United States and Soviet Union. The results of these applications are presented and discussed. The paper concludes with some remarks on how this model can be made more descriptive of the real world situations being modeled. (Author)

**AD-625 195 Fld. 15/7, 4/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**WAR AND WEATHER,**
by I. Zheltikov. 8 Dec 65, 9p. Rept. no. ftd-TT-65-1160
TT 66-60034
Unclassified report

Unedited rough draft trans. from Krasnaya Zvezda (USSR) 30 Sep 1p 1964.

Descriptors: (*Weather forecasting, Military requirements), (*Armed Forces operations, Weather forecasting), Military strategy, Meteorology, USSR

**AD-625 319 Fld. 15/7, 14/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*BAUSCH AND LOMB INC ROCHESTER N Y*
**APPLICATION AND VERIFICATION OF MATHEMATICAL MODEL OF PHOTOGRAPHIC RECONNAISSANCE.**
Interim technical rept. no. 1, 1 Jul-31 Oct 65,
by Walter Wojcik. Nov 65, 21p. Rept. no. b/l-8526-IR-1
Contract AF33 (615)-2630
Unclassified report

Descriptors: (*Photographic reconnaissance, Mathematical models), Photographic contrast, Attenuators, Photographic filters, Frequency analyzers

The three major components of the Contrast Attenuator were studied in detail. These are the dichoric filter arrangement which was also breadboarded, the illumination source and optics, and the neutral density wedge system. A study of the Spatial Frequency Analyzer was made and a breadboard of the system set up. Some photographs illustrating spatial filtering were taken. (Author)

**AD-625 378** **See Fld. 5/9**

**AD-625 585** **See Fld. 17/2**

## 16/1. MISSILE LAUNCHING AND GROUND SUPPORT

**AD-625 352 Fld. 16/1, 22/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**SOME ASPECTS OF AUTOMATIC TEST AND CHECKOUT IN MISSILE AND SPACE SYSTEMS,**
by L. T. Mast. Jul 62, 27p. Rept. no. p-2590
Unclassified report

Descriptors: (*Checkout equipment, Automation), (*Guided missiles, Checkout equipment), Checkout procedures, Automatic, Effectiveness, Costs, Ground support equipment, Feasibility studies

When portions of the factory-to-launch sequence of a missile or space system require automation, the extent of automation and the timing of the introduction of aerospace ground equipment (AGE) should be the result of cost effectiveness studies. The test plan, man-machine capabilities and limitations, relative gain to other alternative approaches, costs, and schedule influences should enter this study. The introduction of automatic AGE involves risks to the mission success rate of the missile or space system. In addition, the installation and checkout of automatic AGE is usually a troublesome process. Schedules and program costs can be adversely effected. To minimize these dangers, a building block approach to automation of AGE is recommended. (Author)

## 16/2. MISSILE TRAJECTORIES

**AD-625 093 Fld. 16/2, 17/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ANALYTICAL CONSTRUCTION OF THE GUIDANCE SYSTEM OF ROCKETS,**
by A. S. Galiullin. 1 Dec 65, 13p. Rept. no. ftd-TT-65-839
TT 66-60000
Unclassified report

Unedited rough draft trans. of Universitet Druzhby Narodov, Moscow. Trudy (USSR) v1 n1 p56-63 1963.

Descriptors: (*Adaptive control systems, Mathematical programming), (*Rockets, Guidance), (*Guidance, Rockets), (*Guided missiles, Adaptive control systems), Trajectories, Flight control systems, Mathematical models, Exterior ballistics, USSR

## 16/4. MISSILES

**AD-625 334** **See Fld. 12/1**

## 16/4.3 UNDERWATER-LAUNCHED MISSILES

**AD-625 193** **See Fld. 5/2**

## 17/1. ACOUSTIC DETECTION

**AD-625 232 Fld. 17/1, 20/1, 18/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**SIMPLIFIED NORMAL MODE TREATMENT OF LONG-PERIOD ACOUSTIC-GRAVITY WAVES IN THE ATMOSPHERE,**
by W. C. Meecham. Nov 65, 38p. Rept. no. rm-4732-ARPA
Contract SD-79 Proj. arpa order-189-61
Unclassified report

Descriptors: (*Acoustics, Nuclear explosions), (*Atmospheric tides, Nuclear explosions), (*Nuclear explosions, Detection), High altitude, Explosion effects, Mechanical waves, Propagation, Low frequency, Sound

A discussion of the effects of geometric dispersion due to stratification of the atmosphere on low-frequency mechanical waves generated by nuclear explosions. It is found that the pressure signal can be divided naturally into an early-arriving acoustic-gravity portion and a later acoustic portion, both portions being inversely proportional to the range (geometric spreading included). At very great ranges, however, portions of the gravity wave fall off faster by r (1/6); the effect of dispersion is to reduce the signal by r (-1/2). Most of the signal is composed of many propagating modes which, at a given range and time, will each demonstrate a characteristic frequency. A simplified treatment of the model picture is presented, along with the argument that a ray treatment for the high-frequency portion is appropriate. (Author)

## 17/2. COMMUNICATIONS

**AD-625 104 Fld. 17/2, 20/1**
*DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)*
**SPEAKING AND LISTENING THROUGH THE HEAD: I. THE INTELLIGIBILITY OF SPEECH RECORDED IN QUIET AT DIFFERENT POSITIONS ON THE HEAD AND THROAT,**

by Keith K. Neely, and S. E. Forshaw. 1965, 7p. Rept. no. drml-RP-553

Unclassified report

*Availability: Published in The Journal of Auditory Research v5 p151-7 1965. Copies to DDC users only.*

Descriptors: (*Speech, Intelligibility), (*Speech transmission, Bone), Voice communication systems, Transducers, Conductivity, Head, Throat, Hearing, Signals, Speech recognition, Auditory perception, Diving, Noise, Effectiveness, Canada

The relative intelligibility of bone-conducted speech uttered in a quiet environment and picked up by each of four different transducers at six positions on the head and throat was investigated with four trained male speakers. The taped speech lists were heard by 16 normal-hearing listeners. Speech intelligibility scores and articulation index calculations gave similar relative estimates of intelligibility. Speech signals were most intelligible from on the forehead, next from the back of the head. The effects of position of the transducer upon the intelligibility of speech was independent of the type of transducer used but tended to vary between speakers. The results of this investigation formed the basis for the development of a two-way bone-conduction communication system for divers. Work has been initiated to determine the effectiveness of the system in various noise environments. (Author)

**AD-625 303 Fld. 17/2, 5/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**AUTOMATIC RECOGNITION OF SPEAKING PERSONS,**
by G. S. Ramishvili. 8 Dec 65, 15p. Rept. no. ftd-TT-65-1079
TT 66-60080

Unclassified report

Unedited rough draft trans. of Akademiya Nauk Gruzinskoi SSR, Tiflis. Soobshcheniya, v36 n2 p279-86 1964.

Descriptors: (*Speech recognition, Automatic), Phonetics, Auditory signals, Sound, Audiofrequency, Speech, Identification, USSR

**AD-625 382 Fld. 17/2, 20/6**
**CFSTI Prices: HC $3.00 MF $0.75**
*ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF*
**MICROWAVE OPTICAL RECEIVER TECHNIQUES.**
Interim engineering rept. no. 2, 1 Sep-30 Nov 65, by J. Richard Kerr. 30 Nov 65, 62p. Contract AF33 (615)-3108

Unclassified report

See also AD-620 825.

Descriptors: (*Light communication systems, Demodulators), (*Demodulators, Light communication systems), (*Phototubes, Light communication systems), (*Microwave communication system, Light communication systems), Optical equipment, Lasers, Light, Modulators, Broadband, Photo multipliers, Feasibility studies, Noise

The report presents the results of the second quarter of effort on a one-year applied research program on the use of various techniques for microwave optical communications through the atmosphere. The relative theoretical advantages of direct and heterodyne optical receivers are considered further, and some popular misconceptions about the nature of background noise are pointed out. Further consideration is also given to modulation and information processing techniques and to the use of multimode lasers in microwave-bandwidth systems. Specific systems are recommended which incorporate present techniques in an optimum manner. A comprehensive experimental program of direct-detection microwave-optical communications over an outdoor path has shown that the multiplier phototubes developed in this laboratory can achieve excellent results with minimum operating difficulty. (Author)

**AD-625 351** **See Fld. 5/3**

**AD-625 652** **See Fld. 14/4**

## 17/2.1 RADIO COMMUNICATIONS

**AD-624 861 Fld. 17/2.1**
*OHIO STATE UNIV COLUMBUS DEPT OF SPEECH*
**COMMUNICATION BY VOICE,**
by John W. Black. 1965, 9p.

Unclassified report

*Availability: Published in Naval Research Reviews p7-14 Feb 1965. Copies to DDC users only.*

Descriptors: (*Voice communication systems, Speech), (*Speech, Intelligibility), Auditory acuity, Speech recognition, Syntax, Phonetics, Hearing, Operations (Personnel), Selection

The report concerns an effort to achieve faultless voice communication. To achieve faultless voice transmission has required, on the one hand, a group of speech and hearing specialists, whose task has been to measure the intelligibility of spoken words, and, on the other hand, various groups of human subjects, whose speech and hearing was to be analyzed. A team of subjects consists typically of a dozen men. One day they compare alternative transmitters; another day, receivers. In rotation, they read lists of English words, 50 words to a list. At least four experimental findings have emerged: Clear evidence that one set of voice-communication equipment is superior to another in terms of transmitting messages correctly. A scaling of words in terms of receptability. For example, football is heard correctly by 95 percent of the listeners; faith, the least readily identified word, is heard correctly by 5 percent of the listeners. The other 598 words fall between football and faith on a recognition scale. Jones is 75 percent intelligible; Smith, 30 percent intelligible; the remaining 10 speakers are ranked between these extremes. Brown identifies 71 percent of the 550 words that he hears; Low identifies 37 percent. The remaining listeners fall between these extremes. The last three findings are discussed in this article.

**AD-625 099 Fld. 17/2.1, 13/10**
*BUREAU OF SHIPS WASHINGTON D C*
**PROJECT SOUTHERN CROSS (NAVAL SHIPS ADVANCED COMMUNICATION SYSTEMS),**
by Allen D. Keimig. 1964, 2p.

Unclassified report

*Availability: Published in Conference Proceedings of the International Convention on Military Electronics (8th), Washington, D. C. Sep 1964. Copies to DDC users only.*

Descriptors: (*Communication systems, Naval vessels (Combatant), Naval equipment, Shipborne, Naval research, Naval vessels (Support)

Project SOUTHERN CROSS is the newest, most imaginative approach to Naval Communications R and D: The total shipboard communication system incorporating the latest in the state of the art; a set of functionally modular building blocks for flexibility in installation, maintenance and system up-dating. The pay-off will be more effective communications for the fleet at reduced installation cost, reduced logistic support cost, and reduced manning requirements.

**AD-625 585 Fld. 17/2.1, 15/7**
**CFSTI Prices: HC $3.00 MF $0.75**
*ELECTRO TECHNICAL ANALYSIS CORP TUCSON ARIZ*
**FREQUENCY ASSIGNMENT STUDIES.**
Quarterly progress rept. no. 1, 1 Aug-31 Oct 65, by A. J. Hoehn, T. W. McCurnin, and L. J. Perper. Nov 65, 94p. Contract DA-28-043-AMC-01232 (E) Proj. DA-1E6-20501-D44901 ECOM 01232-1

Unclassified report

Descriptors: (*Electromagnetic compatibility, Communication systems), (*Radio transmission, Tactical warfare), (*Radiofrequency, Mathematical models), Set theory, Nonlinear systems, Propagation, Mixers (Electronic)

The purpose of this study is to improve electromagnetic compatibility in the field army through development of improved frequency-assignment practices. The general frequency-assignment problem is defined in terms of exclusions imposed by the physical nature of equipments and geographic locations. The problem is formalized through use of mathematical set theory, and solutions discussed. The basis for design of frequency groups which automatically satisfy the set theory expressions is established. Methods for replication of assignments and the combination of the replication scheme with the frequency-group method are covered. Optimization methods, and problems arising from intermodulation and adjacentchannel interference are considered. Generation of spurious signals by nonlinear devices is discussed. Realistic prediction formulas have been developed which reflect the order of nonlinearity generating the signal, and which place no limit on the number of impressed signals which may be considered. Rules are established for an assignment sequence capable of eliminating all odd-order interference generation at a radio-relay type site. An exhaustive survey of the current state of knowledge pertaining to calculation of propagation-path loss is presented. The frequency range from VLF through EHF is examined. Calculation methods and attainable accuracies are discussed. (Author)

**AD-625 325** **See Fld. 9/1**

**AD-625 549** **See Fld. 9/5**

## 17/3. DIRECTION FINDING

**AD-625 413 Fld. 17/3, 20/14**
**CFSTI Prices: HC $6.00 MF $1.25**
*RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA*
**A STUDY OF HIGH-FREQUENCY DIRECTIONAL PROPAGATION OVER A 450 KILOMETER EAST-TOWEST PATH. PART I. DESCRIPTION OF THE DIRECTIONAL PROPAGATION EXPERIMENT (THE COLUMBUS EXPERIMENT). PART II. AN ATLAS OF REDUCED DATA.**
Rept. for 13 Nov 62-4 Mar 64, by R. F. Donnelly, D. G. Detert, and A. D. Bailey. Nov 65, 205p. Rept. no. RRL-254

Unclassified report

Descriptors: (*Direction finding, Radio transmission), (*Radio waves, Propagation), (*Ionospheric propagation, Radio waves), (*High frequency, Radio transmission), Ionosphere, Electromagnetic wave reflections, Radio signals, Angle of arrival, Time, Radio equipment, Ohio

The Columbus Experiment was a relative short range HF radiolocation experiment in which measurements were made of the azimuthal and vertical incidence angles of arrival and the relative time delay of pulse transmissions from Columbus, Ohio (450 km range due east of Urbana). All observations were taken during late afternoon hours and continuing until the propagation path failed. The angle of arrival measurements were made employing a six-element interferometer system in a configuration of three two-element interferometer pairs. Vertical incidence ionosondes were operated at the midpoint and the receiving end of the path. The

basic measurements of azimuthal and vertical incidence angles of arrival were taken on 126 days during the period of the Columbus Experiment. The measurements are presented point by point, approximately two hours on each graph, with both the time and angle scales being identical throughout to facilitate comparisons. It should be emphasized that no averaging of any sort is present in this data, and that each point represents one specific measurement of azimuth or vertical incidence angle.

**AD-624 916 See Fld. 17/7**

**AD-625 074 See Fld. 18/3**

## 17/4. ELECTROMAGNETIC AND ACOUSTIC COUNTERMEASURES

**AD-625 386 Fld. 17/4, 11/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*CONDUCTRON CORP ANN ARBOR MICH*
**FILM RADAR ABSORBING MATERIAL PROGRAM.**
Bibliography of research and development repts.
30 Dec 65, 4p. Rept. no. br/d-3
Contract AF04 (694)-597
Unclassified report

Descriptors: (*Antiradar coatings, Bibliographies), (*Bibliographies, Antiradar coatings), Films, Materials, Absorption, Radar deception

## 17/5. INFRARED AND ULTRAVIOLET DETECTION

**AD-625 380 Fld. 17/5, 22/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*UTAH STATE UNIV LOGAN ELECTRO-DYNAMICS LABS*
**DUAL-CHANNEL SATELLITE RADIOMETER.**
Final rept.,
by C. A. Mortensen, D. J. Baker, and C. L. Wyatt.
1 Aug 65, 67p. Contract AF19 (628)-4209 Proj. AF-0000 Task 000019
AFCRL 65-491
Unclassified report

Descriptors: (*Radiometers, Satellites (Artificial)), (*Infrared equipment, Radiometers), Photoelectric cells (Semiconductor), Infrared detectors, Lead compounds, Sulfides, Selinides, Silicon, Space probes, Instrumentation

A two-channel infrared radiometer designed for use in satellites and space probes is described. The radiometer uses an optical chopper and correlated amplifier system. It uses lead sulfide, lead selenide, or silicon photovoltaic detectors. The minimum detectable radiance is 4 x 10 to the minus 7th power watt/sq cm/ steradian at wavelengths of 2.2 and 2.7 microns. The radiometer has a five decade dynamic range. (Author)

**AD-624 948 See Fld. 4/2**

## 17/7. NAVIGATION AND GUIDANCE

**AD-624 916 Fld. 17/7, 17/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C*
**SECTOR RADIO-RANGE BEACONS WITH RADIATING EQUISIGNAL ZONES,**
by E. Ya. Shchegolev. 1965, 29p. Rept. no. trans-246
TT 65-64823
Unclassified report

Sektornye Radiomayaki s Veerom Ravnosignalnykl Zon, trans. of mono. Radiotekhnicheskie Sredstva Morskogo Sudovozhdeniya, Moscow, 1956 p270-92.

Descriptors: (*Radio navigation, Ships), (*Position finding, Radio navigation), Range finding, Radio equipment, Radio beacons, Navigational aids, Theory, Antennas, USSR

The determination of a ship's location with the aid of sector radio-range beacons is discussed, pointing out the major characteristics of this type of beacon and its operation. The major aspects include the zone of equal audibility of interlocked signals, their transmission, phase alternation and control, the rate and cycles in the transmission of dots and dashes, the equisignal zone, its rotation, arrangement and spacing of antennas. The tables, diagrams and formulas derived for the determination of a ship's location illustrate the practical application of the beacons. (Author)

**AD-625 042 Fld. 17/7, 14/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*MASSACHUSETTS INST OF TECH CAMBRIDGE INSTRUMENTATION LAB*
**INERTIAL INSTRUMENT DESIGN VERIFICATION TESTS FOR HIGH-G APPLICATIONS,**
by Richard E. Marshall, and Peter J. Palmer. Oct 65, 71p. Rept. no. e-1866
Contract AF04 (694)-553 Proj. DSR-52-226,DSR-52-227
Unclassified report

Descriptors: (*Inertial guidance, Instrumentation), (*Instrumentation, Tests), Design, Calibration, Performance (Engineering), Test methods, Gravity, Acceleration

The impact of an inertial guidance system's capability to field calibrate itself stresses the need for instrument testing to demonstrate the instrument's adaptability to positional testing relative to earth's gravity. Corollary tests must prove that instrument coefficients so obtained describe instrument performance over the full extent of variables during operational usage. These tests are called Instrument Design Verification Tests. Test concepts, equipment, and probable physical test limits are presented for single-degree-of-freedom instruments. (Author)

**AD-625 114 Fld. 17/7**
**CFSTI Prices: HC $3.00 MF $0.75**
*ELECTRONICS MAINTENANCE ENGINEERING CENTER NORFOLK VA*
**EVALUATION OF PROPOSED MODIFICATIONS TO THE AN/UPN-15 SERIES LORAN C RECEIVERS.**
Interim rept.,
by Gordon T. Fedders. 7 Jun 65, 71p. Rept. no. emec-11-65
Unclassified report

Descriptors: (*Loran equipment, Performance (Engineering)), Modification kits, Tests, Navigational aids, Radio navigation, Radio receivers

An evaluation of AN/UPN-12 ( ) and AN/UPN-15 ( ) field changes produced by EMEC was conducted. The basic AN/UPN-12 is a LORAN A receiver which is modified by installation of Field Change 1-AN/UPN-12 ( ) to provide LORAN C capability. Nomenclature is changed to AN/UPN-15 ( ) after modification. The modified equipment was installed in a naval aircraft and flown to Nassau, Bahamas. Performance data were collected enroute, on the ground at Nassau, and at the Naval Air Test Center, Patuxent River, Maryland. X and Y delay readings were recorded during both day and night periods as well as the transition periods at sunrise and sunset. The data were tabulated on graphical form for analysis. Although three of the four field changes produced no outward effect, they did contribute to overall equipment stability and reliability. The fourth modification provided a less ambiguous video display and produced much more consistent results when two ground waves were matched. Sky-wave match was more troublesome because of envelope distortion when ground and sky waves combine. Additional errors resulted when the two signals traveled via substantially different distances (the X signal 200 miles and the Y signal 1200 miles) to the receiver.

**AD-625 490 Fld. 17/7, 20/14**
**CFSTI Prices: HC $4.00 MF $1.00**
*DECO ELECTRONICS INC BOULDER COLO*
**OMEGA NAVIGATIONAL SYSTEM CONDUCTIVITY MAP.**
Final rept.,
by Robert R. Morgan, and Eugene L. Maxwell.
Dec 65, 120p. Rept. no. 54-F-1
Contract Nonr-4107 (00) Proj. NR-371-630
Unclassified report

Descriptors: (*Hyperbolic navigation, Navigation charts), (*Navigation charts, Radio navigation), (*Radio navigation, Navigation charts), Earth (Planet), Electrical conductance, Mapping, Very low frequency, Radio waves, Propagation, Attenuation, Geophysics, North America

A conductivity map of North America has been prepared showing effective earth conductivity values for a 10 kc/s propagating wave. This map was prepared as an aid in propagation studies and chart preparations for the Omega Navigational System using a technique referred to as 'geologic correlation'. Values of conductivity were determined for regions whose boundaries are based upon climatological, pedological, physiographical, and geological information. Regional values were based (whenever possible) on available conductivity data taken within these regions. Additional four-terminal array conductivity measurements were made in the permafrost region of the Canadian Shield and along the Gulf Coast to aid in the determination of conductivities for these regions. The effective conductivity map is printed on a 17 X 22 inch sheet, and utilizes color hue and saturation to present effective conductivity values in half-decade steps from 1 X 0.00001 mho/meter (for the Greenland ice-cap) to 3 X 0.01 mho/meter. Confidence and variability factors are indicated on the map. (Author)

**AD-624 982 See Fld. 22/3**

**AD-625 093 See Fld. 16/2**

## 17/8. OPTICAL DETECTION

**AD-625 230 Fld. 17/8, 5/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*HUMAN ENGINEERING LABS ABERDEEN PROVING GROUND MD*
**TARGET DETECTION USING BLACK-AND-WHITE TELEVISION. STUDY II: DEGRADED RESOLUTION AND TARGET-DETECTION PROBABILITY.**
Technical memo.,
by Lynn C. Oatman. Jul 65, 22p. Rept. no. tm-10-65
Unclassified report

Descriptors: (*Target recognition, Television display systems), (*Television display systems, Resolution), (*Human engineering, Target recognition), Degradation, Monitors, Visual perception, Probability, Analysis of variance

The study used a black-and-white closed-circuit television (TV) system to investigate the effects of two levels of TV resolution (800 and 450 lines) on the probability that subjects would detect an M-48 tank. While a previous study used horizontal degradation only, this one degraded the TV image in both horizontal and vertical dimensions. The tank was shown in each of nine areas of the TV screen, under both levels of resolution. Thirty subjects observing the TV monitor were asked to indicate in which of the nine areas the tank ap-

peared. With changes in the horizontal resolution only, in the previous study, changing resolution from 800 to 400 lines did not affect target-detection probabilities significantly. But with both horizontal and vertical changes, subjects performed significantly better at the 800 level of resolution than at the 450 level. The tank's location on the TV screen, although confounded with other variables, appeared to have an important effect on target-detection probability. (Author)

**AD-625 231 Fld. 17/8, 5/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*HUMAN ENGINEERING LABS ABERDEEN PROVING GROUND MD*
**TARGET DETECTION USING BLACK-AND-WHITE TELEVISION. STUDY I. THE EFFECTS OF RESOLUTION DEGRADATION ON TARGET DETECTION.**
Technical memo.,
by Lynn C. Oatman. Jul 65, 22p. Rept. no. tm-9-65

Unclassified report

Descriptors: (*Target recognition, Television display systems), (*Television display systems, Resolution), (*Human engineering, Target recognition), Degradation, Monitors, Visual perception Probability, Analysis of variance

The probability of detecting an M-48 tank at four different levels of television (TV) resolution (800,600, 400, and 300 lines) was investigated on a black-andwhite closed-circuit TV system. The four levels of TV resolution were presented to 16 subjects, who were asked to indicate in which one of nine areas the tank appeared on the TV screen. The data indicated that subjects performed about equally well at the 800, 600, and 400 levels of resolution; however, their performance was significantly poorer at the 300 level of resolution. The tank's location on the TV screen was an important factor in the probability of target detection, but was confounded with other variables. (Author)

## 17/9. RADAR DETECTION

**AD-625 163 Fld. 17/9**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB*
**ON MEASURING THE RADAR CROSS SECTIONS OF DUCKS AND CHICKENS.**
Physical sciences research papers,
by P. Blacksmith,Jr., and R. B. Mack. 12 May 65, 11p. Rept. no. psrp-157
Proj. AF-5635 Task 563502
AFCRL 65-769

Unclassified report

*Availability: Published in Proceedings of the IEEE v53 n8 p1125 Aug 1965. Copies to DDC users only.*

Descriptors: (*Radar echo areas, Birds), (*Birds, Radar echo areas), Radar targets, Chickens, Radar reflections, Spectrum signatures, Radar tracking

The experimental determination of the RCS of some typical birds is described. The results, which are summarized, can have significant implications in the operation of both ground based and aircraft radars. (Author)

**AD-625 164 Fld. 17/9, 20/14**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB*
**A LOOK INTO THE FUTURE OF RADAR SCATTERING RESEARCH AND DEVELOPMENT.**
Revised ed.,
by W. F. Bahret, and C. J. Sletten. 4 May 65, 18p. Rept. no. SR-36
Proj. AF-4600 Task 460004
AFCRL 65-809

Unclassified report

Revision of manuscript submitted 23 Mar 65.

*Availability: Published in Proceedings of the IEEE v53 n8 p786-95 Aug 1965. Copies to DDC users only.*

Descriptors: (*Radar echo areas, Scientific research), (*Radar tracking, Radar echo areas), (*Electromagnetic wave reflections, Radar targets), Electromagnetism, Scattering, Radar signals, Radar reflections, Target recognition, State-of-the-art reviews

In estimating future trends in radar scattering research and development the authors take the view that the dynamics of progress and change will be governed largely by user demands. Emerging developments in radar for space applications, reflectivity from plasma and other permeable bodies, object resolution and recognition, and synthesis of radar cross section characteristics will in the main stimulate and constrain the direction of future scattering research. The authors speculate on the likely contributions to be expected from known theoretical and experimental approaches to scattering problems. The relative merits of quasi-optical approximation, boundary value solutions, and integral equation formulations suitable for high speed digital computers are examined. The scientific frontier includes the response of targets to partially coherent electro-magnetic waves and the resolution and identification of distributed and statistically representable objects by tomorrow's data processing radar sensors. (Author)

**AD-624 887** **See Fld. 8/2**

**AD-625 118** **See Fld. 14/2**

## 17/10. SEISMIC DETECTION

**AD-625 199 Fld. 17/10, 8/11, 14/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA RESEARCH AND ENGINEERING SUPPORT DIV*
**EXPLORATORY MEETING ON THE MAGNETIC TAPE RECORDING OF SEISMIC DATA.**
Research paper,
by Joseph M. Aein. Sep 65, 27p. Rept. no. RP-P-210 ,IDA/HQ-65-4151
Contract SD-50

Unclassified report

Descriptors: (*Seismology, Magnetic recording systems), (*Magnetic recording systems, Seismology), High frequency, Seismic waves, Seismometers, Magnetic tapes, Data storage systems, Analog systems, Frequency Modulation, Detection, Nuclear explosions, Symposia

The problems of obtaining magnetic tape records of seismic data over a relatively wide bandwidth (up to 10 cps) with large dynamic range are reviewed, and current seismic tape recording capabilities are surveyed.

**AD-625 006** **See Fld. 8/11**

**AD-625 221** **See Fld. 8/11**

**AD-625 460** **See Fld. 8/11**

**AD-625 461** **See Fld. 8/11**

**AD-625 467** **See Fld. 8/11**

**AD-625 514** **See Fld. 8/11**

**AD-625 515** **See Fld. 8/11**

**AD-625 516** **See Fld. 8/11**

**AD-625 518** **See Fld. 8/11**

**AD-625 552** **See Fld. 8/11**

**AD-625 553** **See Fld. 8/11**

## 18/2. ISOTOPES

**AD-625 406 Fld. 18/2, 18/6**
**CFSTI Prices: HC $3.00 MF $0.50**
*CATHOLIC UNIV OF AMERICA WASHINGTON D C DIV OF NUCLEAR SCIENCE AND ENGINEERING*
**THE PHYSICS AND SHIELDING ASPECTS OF HETEROGENEOUS ISOTOPIC NEUTRON SOURCES,**
by Donald F. Knuth. Jul 65, 56p. Contract Nonr-2249 (13)

Unclassified report

Descriptors: (*Neutrons, Sources), (*Radioactive isotopes, Shielding), Alpha particle reactions, Neutron reactions, Polonium, Beryllium, Half life, Alpha decay, Neutron spectrum, Feasibility studies

This study is concerned with the feasibility of constructing an isotopic neutron source which has the characteristic that it can be turned on or off at the option of the user. The alpha-neutron reaction was selected to be the source of neutrons. It was desired that a suitable combination of radioisotope material and target material be selected which exhibited a high neutron yield when the two materials were placed into the on mode, and yet exhibited low radiation intensities when the source was in the off mode. This way, a compace source of high intensity would be possible which would require little or no shielding when not in use. Source half-life, material availability and cost were considered. It was concluded that two radioactive materials, polonium-210 and plutonium-238, appeared to be the most attractive radioisotope materials. For a mechanical on-off system, beryllium was considered to be the best target material since it exhibits the highest yield in an alpha-neutron reaction. Typical neutron energy spectra and neutron yeilds were calculated which showed that the ratio of neutrons emitted while in the on mode compared to the off mode was on the order of 10,000. Calculations were made of neutron and gamma ray intensities.

**AD-625 415 Fld. 18/2, 18/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*CATHOLIC UNIV OF AMERICA WASHINGTON D C DIV OF NUCLEAR SCIENCE AND ENGINEERING*
**VARIABLE INTENSITY ISOTOPIC SOURCES.**
Annual summary rept. 1 Dec 64-30 Jun 65,
by E. D. Jordan, and T. E. Carew. Aug 65, 25p.
Contract Nonr-2249 (13)

Unclassified report

Descriptors: (*Neutrons, Sources), (*X rays, Sources), (*Radioactive isotopes, Shielding), Alpha particle reactions, Intensity, Neutron spectrum, Bremsstrahlung, Heat transfer, Polonium, Beryllium, Calcium, Promethium, Strontium, Thulium

The feasibility is studied of isotopic radiation sources of variable output. It is possible to change the effective yields of isotopic sources which have an output dependent on the interaction of alpha or beta particles with target materials. This can be accomplished by a change in source geometry in a manner which would result in an intimate association or separation of the radiation source material and the target matrix. The capability of changing the source output could facilitate the safe handling of a source of relatively high maximum output without requiring extensive shielding. Since these sources will produce some penetrating radiation in their lowest and the highest achieveable output under conditions of variable source geometry must be considered. In a detailed investigation of possible (alpha,n) reactions, beryllium was determined to be the best target material while polonium-210 and plutonium-238 were the best alpha source materials. Engineering considerations ap-

plicable to heterogeneous neutron source designs are described. These include encapsulation for physical containment of polonium within the source, heat generation and heat transfer, and mechanisms of damage to stainless steel or gold windows used for containment of polonium. For variable output bremsstrahlung sources, four nuclides identified as most suitable are calcium-45, preomethium-147, strontium-90, and thulium-170.

## 18/3. NUCLEAR EXPLOSIONS

**AD-625 074 Fld. 18/3, 20/14, 17/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**EFFECTS OF PROPAGATION ON THE HIGH-FREQUENCY ELECTROMAGNETIC RADIATION FROM LOW-ALTITUDE NUCLEAR EXPLOSIONS,**
by W. Sollfrey. Nov 65, 36p. Rept. no. rm-4741-ARPA
Contract SD-79 ,ARPA Order-189-61
Unclassified report

Descriptors: (*Nuclear explosions, Detection), (*Electromagnetic waves, Nuclear explosions), Propagation, Radio waves, Attenuation, Ionosphere, Electromagnetic wave reflections, Electromagnetic pulses, High frequency

The high-frequency electromagnetic pulse radiation from nuclear explosions presents a possible detection mechanism for low-altitude or ground bursts as well as for bursts in outer space. This radiation propagates around the earth via ground wave or ionospheric reflection, and it is necessary to determine what effect this propagation will have on the received signals. The Memorandum first considers the attenuation of the pulse when it travels via ground wave. Effects of the height of the source are included. Severe selective attenuation does occur, with the higher frequency components suffering most. The ionospheric waves suffer relatively little attenuation, but are strongly dispersed, leading to limitations on the pulse length which can be resolved. The receiver bandwidth should be selected to match the ionospheric dispersion at the receiver frequency. From all these considerations, it is clear that propagation effects will very strongly modify the pulse shape and pulse amplitude relative to free space. (Author)

**AD-625 040** **See Fld. 13/12**

**AD-625 232** **See Fld. 17/1**

**AD-625 556** **See Fld. 8/11**

## 18/4. NUCLEAR INSTRUMENTATION

**AD-625 463** **See Fld. 20/8**

## 18/6. RADIATION SHIELDING AND PROTECTION

**AD-624 874** **See Fld. 11/2**

**AD-625 406** **See Fld. 18/2**

**AD-625 415** **See Fld. 18/2**

## 18/8. RADIOACTIVITY

**AD-625 014 Fld. 18/8, 9/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*OSLO UNIV (NORWAY)*
**A FORTRAN PROGRAMME FOR THE ANALYSIS OF HYPERFRAGMENTS AND FOR OTHER EMULSION STUDIES,**
by A. G. Frodesen, K. S. Kolbig, and M. M. Nicolic. 1965, 76p. Contract AF-EOAR-100-63
Proj. AF-9751 Task 975101
CERN 65-6, AFOSR 65-6735
Unclassified report

Descriptors: (*Programming (Computers), Hyperons), (*Hyperons, Decay schemes), Baryons, Momentum, Identification, Charged particles, Radioactive isotopes

A FORTRAN computer programme is described which is primarily designed as an aid for the identification of hyperfragments from a kinematical analysis of the production and decay vertices, but which may also be applied to other emulsion studies. The programme considers the kinematics for: (1) capture at rest of a negative meson or negative baryon on light emulsion nuclei, leading to the formation of a number of charged secondaries, and at the most one neutral particle; (2) decay at rest of a hyperfragment into charged particles and at the most one neutral particle; and (3) decay in flight of a hyperfragment into charged particles. The subroutines of the programme are described, and range-energy tables (tables of isotopes and particles with binding energies of hypernuclei) and a list of FORTRAN variables are given. (Author)

**AD-625 039 Fld. 18/8, 9/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ABOUT RADIATION INJURIES TO RADIO COMPONENTS IN A SHARP GAMMA-RADIATION FIELD,**
by G. Aipov, E. M. Lobanov, and N. Shadiev. 25 Oct 65, 7p. Rept. no. ftd-TT-64-718
TT 65-64835
Unclassified report

Unedited rough draft trans. of mono. Radiatsionye Effektii v Tverdykh Telakh, Tashkent, 1963 p68-70.

Descriptors: (*Capacitors, Radiation damage), (*Radiation damage, Capacitors), Gamma rays, USSR

The effect of powerful dosages of gamma-radiation on electric and mechanical properties of certain industrial capacitors with different dielectrics was investigated. The investigation covered mica, paper oil, electrolytic and ceramic capacitors. In order to eliminate the effect of conventional errors on the results, we tested several capacitors of each type and average the obtained data. The capacitance of the capacitors, leakage resistance, quality were measured prior and after radiation. The charge of the capacitors was determined at working voltage on them.

**AD-625 341 Fld. 18/8, 9/1, 20/12**
**CFSTI Prices: HC $3.00 MF $0.75**
*NORTRONICS NEWBURY PARK CALIF APPLIED RESEARCH DEPT*
**STUDY FOR GENERALIZED MODEL FOR SEMICONDUCTOR RADIATION RESPONSE PREDICTION.**
Quarterly progress rept. no. 2, 15 Mar-15 Jun 65, by James P. Raymond, and William W. Chang.
15 Jun 65, 72p. Rept. no. nvr-3920
Contract DA-28-043-AMC-00423 (E) Proj. DA-5900.21.830.23.00 Task 16.009
ECOM 00423-2
Unclassified report

See also AD-618 079.

Descriptors: (*Semiconductor devices, Radiation damage), (*Radiation damage, Semiconductor devices), Diodes (Semiconductor), Transistors, Transients, Mathematical models, Ionization, Solid state physics, Neutrons, Integrated circuits

Investigations included the further study of grown junction diodes and transistors, and the initial study of the transistor element of a monolithic chip integrated circuit. The ionizing radiation response of the diode was calculated using the known values of diode recovery time and junction area. Calculated and observed photocurrents are within a factor of two. The common-emitter response of the grown-junction transistor was calculated. The open-base and small-signal transistor response was obtained from electrical parameter measurement and the collector photocurrent with source resistance of zero. Discrepancies between calculated and observed waveforms are attributed to variations in common-emitter current gain and carrier motion by drift in the collector region. Ionizing radiation effects in an integrated circuit transistor element were studied analytically and experimentally. The lumped model demonstrates the motion of carriers generated in the collector region to the base or substrate regions. The common-emitter response is used to show the influence of the substrate photocurrent on the total observed collector current. Neutron-induced lifetime degradation was directly introduced in the transistor lumped model to give the expected form of transistor gain reduction. The results compare favorably to the Messenger-Spratt prediction. (Author)

**AD-625 051** **See Fld. 9/1**

**AD-625 157** **See Fld. 9/1**

**AD-625 439** **See Fld. 4/1**

**AD-625 440** **See Fld. 10/2**

**AD-625 448** **See Fld. 8/5**

**AD-625 475** **See Fld. 11/6**

**AD-625 533** **See Fld. 9/1**

## 18/10. REACTOR MATERIALS

**AD-625 586 Fld. 18/10, 10/2, 18/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARIZONA UNIV TUCSON ENGINEERING EXPERIMENT STATION*
**THE EFFECT OF SIMULATED FISSION PRODUCTS IN THE INTER-ELECTRODE SPACING OF A THERMIONIC DIODE.**
Annual rept. no. 1, 1 Nov 64-1 Nov 65,
by Monte V. Davis, C. E. Backus, E. J. Britt, and D. M. Turner. 17 Dec 65, 23p. Contract Nonr-2173 (13)
Unclassified report

Descriptors: (*Thermionic converters, Reactor system components), (*Fission product poisoning, Diodes), (*Diodes, Electrodes), Fission products, Iodine, Helium group gases, Argon, Xenon, Krypton, Electron tubes, Configuration

The nuclear heating of in-core thermionic diodes to directly convert heat to electricity allows a compact, high-powered, long-lived system design. There are, however, some unanswered problems, one of which is the effect of admitting fission products into the interelectrode spaces of the system. This could happen in the case of a cladding rupture or by the impurities diffusing through the fuel from the hotter center to the surface of the fueled emitter. The effects of the fission products on the diode operation are considered. The materials representing fission products are individually introduced into the operating diode and the results compared to the theoretically determined model. The research has covered the effects of the noble gases argon, xenon, and krypton and of iodine on the operation of a planar thermionic diode. The effects of high temperature on the insulating properties of ceramic materials have been examined to delineate the problems of electrical breakdown that may occur in high powered thermionic reactor systems and to define safe areas of system temperature and voltages.

**AD-625 475** **See Fld. 11/6**

## 18/11. REACTOR PHYSICS

**AD-625 586** **See Fld. 18/10**

## 19/1. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

**AD-625 150 Fld. 19/1, 19/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**CALCULATION OF COMPOSITION OF EXPLOSIVES AND DETONATION PARAMETERS OF CONDENSED EXPLOSIVES,**
by V. N. Zubarev, and G. S. Telegin. 30 Nov 65, 12p. Rept. no. ftd-TT-65-1004
TT 66-60011
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady v158 n2 p452-5 1964.

Descriptors: (*Explosive materials, Detonations), (*Detonation waves, Equations of state), (*Explosion gases, Concentration (Chemistry)), Carbon monoxide, Hydrogen, Chemical equilibrium, Decomposition, Detonations, TNT, RDX, Tetryl, Nitrophenols, USSR

Topics include: effect of carbon monoxide and molecular hydrogen on the composition of explosion products; detonation wave parameters of TNT, Hexogene, TEN, tetryl, and picric acid as determined on the basis of explosion product equations of state.

**AD-625 512 Fld. 19/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*FRANKFORD ARSENAL PHILADELPHIA PA PROPELLANT ACTUATED DEVICES DIV*
**DESIGN IMPROVEMENT OF HIGH TEMPERATURE INITIATOR DESIGNATED 'INITIATOR, CARTRIDGE ACTUATED: XM100.'**
Technical research rept.,
by George P. Miller. Nov 65, 33p. Rept. no. r-1780
Proj. DA-23417
Unclassified report

Descriptors: (*Cartridges (PAD), Experimental design), Explosive actuators, Explosives initiators, Safety, Projector charges, Escape systems (Aerospace)

In this project a program was originated to improve an M27 type of initiator. The improved model was designated XM100. Essentially, there were eight major and sixteen minor modifications, all intended to reduce costs, increase efficiency, and promote safety. Once the unit has been fired, important safety features are - it cannot be mistaken for an unfired unit; it cannot be installed as an operational unit; nor can it be reassembled inadvertently. A universal mount enables the unit to be located in any of the normal positions, including bulkhead mounting. A new, hermetically sealed cartridge and the high energy 120-inch ounce firing mechanism increase reliability. The over-all design shows that this initiator embodies most of the improvements suggested by users and as projected by experienced design engineers. (Author)

**AD-625 529 Fld. 19/1, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FRANKFORD ARSENAL PHILADELPHIA PA QUALITY ASSURANCE DIRECTORATE*
**ESTABLISHMENT OF QUALITY ASSURANCE REQUIREMENTS FOR AMINOGUANIDINE BICARBONATE.**
Test rept.,
by George Norwitz, Michael Galan, and Martin E.Everett. Oct 65, 16p. Rept. no. t66-1-1
Unclassified report

Descriptors: (*Guanidines, Quality control), Bicarbonates, Amines

Recommended quality assurance requirements: Appearance fine white powder; odor, none; assay, 99% minimum; insoluble in hydrochloric acid, 0.02% maximum; moisture, 0.15% maximum; residue on ignition 0.10% maximum; sulfate (as Na2S04) 0.02% maximum; and chloride (as NaC1), 0.01% maximum. (Author)

**AD-625 658 Fld. 19/1, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*PICATINNY ARSENAL DOVER N J AMMUNITION ENGINEERING DIRECTORATE*
**COMPARISON OF SKIP LOT AND GRAND LOT BALLISTIC TESTING BY USE OF COMPUTER SIMULATION.**
Technical memo.,
by Donald C. Rappaport. Nov 65, 40p. Rept. no. tm-1757
Unclassified report

*Distribution: No limitation.*

Descriptors: (*Ammunition, Test methods), (*Ballistics, Test methods), Computers, Simulation, Quality control

A computer simulation of the ballistic testing of a stockpile of ammunition was accomplished 100 times using four different stockpiles and sampling plans and three different production schemes. The goal of acceptance testing is uniform, serviceable ammunition. The statistical evidence presented indicates that skip lot testing is no more desirable than other possible methods of reduced ballistic testing. (Author)

**AD-625 659 Fld. 19/1, 14/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*PICATINNY ARSENAL DOVER N J AMMUNITION ENGINEERING DIRECTORATE*
**VALUE RESPONSIBILITY OF THE DESIGNER.**
Technical memo.,
by Albert G. Nash. Dec 65, 18p. Rept. no. tm-1767
Unclassified report

Descriptors: (*Ammunition, Design), (*Value engineering, Ammunition), Production, Cost effectiveness, Military requirements

The report gives a realistic background picture of ammunition design. This picture -- while positive in respect to achieving further value -- also indicates many of the limitations and pitfalls which personnel must face if successful work is to be accomplished. This presentation was given to the Value Engineering Seminar at Iowa Army Ammunition Plant at Burlington, Iowa on 28 October 1965. (Author)

**AD-625 008 See Fld. 7/4**

**AD-625 051 See Fld. 9/1**

**AD-625 251 See Fld. 15/3**

**AD-625 326 See Fld. 19/4**

**AD-625 397 See Fld. 7/3**

## 19/3. COMBAT VEHICLES

**AD-625 117 See Fld. 5/5**

## 19/4. EXPLOSIONS, BALLISTICS, AND ARMOR

**AD-625 158 Fld. 19/4, 21/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ON DETONATION COMBUSTION OF HETEROGENEOUS SYSTEMS,**
by V. E. Gordeiev, V. F. Komos, and Ya. K. Troshin. 3 Dec 65, 12p. Rept. no. ftd-TT-65-1106
TT 66-60019
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady, v160 n4 p853-6 1965.

Descriptors: (*Combustion, Gases), (*Detonations, Gases), Mixtures, USSR, Oxygen, Air, Oils, Pipes

**AD-625 326 Fld. 19/4, 21/2, 19/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**THE THEORY OF DETONATION, THE COMBUSTION MECHANISM, AND THE PROPERTIES OF EXPLOSIVES,**
by Seraphim Parandjuk. 8 Dec 65, 37p. Rept. no. atd-65-111
TT 66-60085
Unclassified report

Compilation of abstracts based on Soviet open literature.

Descriptors: (*Detonations, Abstracts), (*Combustion, Abstracts), (*Explosive materials, Abstracts), Bibliographies, USSR

**AD-625 391 Fld. 19/4, 8/13**
**CFSTI Prices: HC $5.00 MF $1.00**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**AN INVESTIGATION OF THE EFFECTS OF GRAVITY ON CRATER FORMATION IN A COHESIONLESS MEDIUM.**
Master's thesis,
by Leon Karol Moraski, and David Jens Teal.
Jul 65, 190p. Rept. no. mech/GSF-65-35
Unclassified report

Descriptors: (*Gravity, Cratering), (*Cratering, Gravity), Soil mechanics, Experimental data, Statistical tests, Explosion effects, Sand

An experimental investigation was conducted on the effects of gravity on explosion crater formation. Accompanying the presentation of the experimental results is a discussion of gravity effects on the cratering processes of compaction, scouring, spalling, and gas acceleration. The discussion suggests that gravity influences the shear resistance of the medium and the range of the particle throwout and hence should influence the crater formation. To test this hypothesis, an experiment was conducted in a medium of dry silica sand using a sixgrain electrically initiated squib as the explosive source. Craters were formed under 0.17 g, 0.38 g, 1.0 g, and 2.5 g conditions and at depths of burst ranging from surface to five inches. The statistical t-test was used to determine if the crater depth and diameter were affected by the gravity field. Crater dimensions versus depth of burst (DOB) were compared for the different gravity fields to study the effect on the optimum and maximum DOB. An equation expressing crater dimensions as a decreasing exponential function of increasing gravity was assumed. Parameters of the exponential function were adjusted to achieve the best fit in the least-squares sense. (Author)

**AD-625 396 Fld. 19/4, 13/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS FORT BELVOIR VA*
**BLAST EFFECTS ON U.S. ARMY WATER-STORAGE CONTAINERS.**
Research rept. for Feb 63-Jun 65,
by Paul E. DesRosiers, and Don C. Lindsten.
Oct 65, 48p. Rept. no. aerdl-RR-1832
Proj. AERDL-1M624101D551 Task 1M624101D55107
Unclassified report

Descriptors: (*Water tanks, Blast), (*Storage tanks, Blast), Army equipment, Water

supplies, TNT, Radiological contamination, Radioactive fallout, Pressure, Detonations, Vulnerability

The report covers a study made at the Suffield Experimental Station, Canada, investigating the vulnerability to blast of current military water-storage tanks and experimental, pillow-type, water-storage containers relative to: (1) shock damage, and (2) water contamination resulting from air-borne dust. Tanks filled with water were exposed to the effects of a 500-ton TNT detonation. The results of the study indicate that: (1) rubberized-fabric, water-storage tanks, both of the pillow and the upright-cylinder type (with the exception of the top cover cloth which is subject to damage with overpressures as low as 5.2 psi), can withstand the shock effects from a high explosive detonation up to 9.8-psi overpressure; (2) flying debris can cause extensive damage, regardless of overpressure; and (3) the water in upright, cylinder tanks can become contaminated with sufficient air-borne dust to be above tolerances if the detonation is a nuclear one; whereas, the water in pillow tanks remains uncontaminated. (Author)

**AD-625 489 Fld. 19/4, 21/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*OHIO STATE UNIV COLUMBUS ROCKET RESEARCH LAB*
**FORMATION OF DETONATION WAVES IN COMBUSTIBLE GASEOUS MIXTURES,**
by Loren E. Bollinger. Apr 64, 49p. Contract AF-AFOSR-203-63 AFOSR 65-2205
Unclassified report

Pub. by Western States Section, Combustion Inst., Stanford Univ., Calif. as WSS/CI-Paper-64-15.

Descriptors: (*Detonation waves, Gases), (*Mixtures, Detonation waves), Combustion, Reviews, Deflagration, Propulsion, Stability, Rocket motors, Fuels

A review is presented of selected papers and reports which pertain to the formation of detonation waves in combustible gaseous mixtures. During the past decade, extensive progress has been made in elucidating the mechanism, and the parameters that influence it, by which a deflagration wave accelerates and forms a stable detonation. Propulsion devices which employ stabilized detonation waves are being studied; thus, it is necessary to learn more about the transition process. Many investigators believe that a better understanding of the process of detonation-wave formation will assist in the explanation and eventual control of combustion instability in rocket engines. (Author)

**AD-625 566 Fld. 19/4, 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*TULANE UNIV NEW ORLEANS LA DEPT OF MECHANICAL ENGINEERING*
**A FLOW MODEL AND ANALYSIS OF A ROCKET PAIR IN CLOSE PROXIMITY,**
by Hugh A. Thompson, and Henry F. Hrubecky. Jan 65, 39p.
Unclassified report

Descriptors: (*Rocket trajectories, Aerodynamics), (*Aerodynamics, Rocket trajectories), (*Mathematical models, Aerodynamics), Optimization, Programming (Computers)

In the flight of a pair of rockets or the salvo firing of several rockets, the trailing ones may be deflected toward the trajectory of the leading rocket. The progress that has been made in investigating the aerodynamic aspects of this problem are presented in this report. Two areas in the flow field have been isolated as regions in which an aerodynamic interaction could occur between rockets. A mathematical model has been developed which simulates the simpler of these regions: the perturbation of an inviscid, incompressible flow field by the passage of the leading rocket and the subsequent flight through this disturbed flow by the trailing rocket. This model employs a numerical method known as the method of successive overrelaxations to compute the resultant of the aerodynamic pressure force and the point at which it is concentrated for both a leading and a trailing rocket. The data that are required by the model and the problem areas that remain in the preparation of these data are presented and discussed. (Author)

**AD-625 574 Fld. 19/4, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB*
**CONTRIBUTION TO THE PROBLEM OF ESTIMATING THE LENGTH OF THE CHEMICAL REACTION ZONE BEHIND THE FRONT OF A DETONATION WAVE,**
by G. G. Rempel. 30 Nov 65, 21p. Rept. no. tg-230-T453
Contract NOw-62-0604-c TT 66-60094
Unclassified report

Trans. of Vzryvnoe Delo (USSR) n52/9 p39-56 1963.

Descriptors: (*Detonation waves, Chemical reactions), (*Chemical reactions, Measurement), (*Explosive materials, Reaction kinetics), USSR

**AD-625 150** **See Fld. 19/1**

**AD-625 151** **See Fld. 21/2**

**AD-625 173** **See Fld. 13/12**

**AD-625 499** **See Fld. 21/8**

**AD-625 605** **See Fld. 14/2**

## 19/8. UNDERWATER ORDNANCE

**AD-625 513 Fld. 19/8, 7/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF*
**HIGH-PRESSURE GAS FROM LITHIUM HYDRIDE AND SEA WATER,**
by Gerrit DeVries. Dec 65, 21p. Rept. no. nots-TP-3959
Task RUTO-3E-000/216-1/E008-06-02
NAVWEPS 8990
Unclassified report

Descriptors: (*Gas generating systems, Underwater), (*Torpedoes, Recovery), (*Hydrogen, Synthesis (Chemistry)), Lithium compounds, Hydrides, Sea water, High-pressure research, Inflatable structures, Environmental tests, Pressure, Temperature, Additives

Tests were made to determine the quantity and rate of gas produced from the lithium hydride-sea water reaction. The effects of particle size, pressure, temperature, water composition, water-lithium hydride ratio, and additives to the lithium hydride were investigated. In addition, a gas inflation system for torpedo recovery using lithium hydride was designed and tested in the ocean. Lithium hydride and water were found to react completely at a ratio of 25 (or more) parts water: 1.0 part lithium hydride, by weight. The effects of other variables on the reaction were minor. The lithium hydride torpedo-recovery system successfully raised 50 pounds from a depth of 2,600 feet. (Author)

## 20. PHYSICS

**AD-624 883** **See Fld. 3/2**

## 20/1. ACOUSTICS

**AD-624 986 Fld. 20/1**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE PHYSICAL LAB*
**THE SCATTERING OF PLANE WAVES FROM PERIODIC SURFACES,**
by J. L. Uretsky. 17 Nov 64, 29p. Rept. no. MPL-U-76/64
Contract Nonr-2216 (05)
Unclassified report

Prepared in cooperation with Argonne National Lab., Ill.

*Availability: Published in Annals of Physics v33 n3 p400-27 Jul 1965. Copies to DDC users only.*

Descriptors: (*Acoustics, Wave functions), (*Wave functions, Acoustics), Mechanical waves, Scattering, Electromagnetic wave reflections, Theory

The reflection of scalar plane waves from periodic surfaces (in two dimensions) is studied. Particular attention is devoted to the sinusoidal surface upon which the wave function vanishes. The formulation of the problem rests upon Green's theorem, and it is shown that in the sinusoidal case one is led to an infinite set of coupled algebraic equations. These are essentially different from the equations derived by Rayleigh in his original formulation of the problem. Numerical results are obtained, and the more interesting properties of the results are discussed. As a sidelight, it is shown that the matrix of reflection coefficients for an arbitrary periodic nonabsorbing surface has interesting symmetry properties reminiscent of the quantum-mechanical Smatrix. (Author)

**AD-625 197 Fld. 20/1, 9/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**DEVICE FOR THE ANALYSIS OF THE INSTANTANEOUS SPECTRUM OF A VOICE SIGNAL IN HARMONIC DECODERS,**
by V. I. Kulya. 21 Oct 65, 6p. Rept. no. ftd-TT-65-793
TT 66-60036
Unclassified report

Unedited rough draft trans. of Patent (USSR) 158 600, appl. no. 762403/26-9, 1 Feb 62.

Descriptors: (*Harmonic analyzers, Sound signals), (*Voice communication systems, Harmonic analyzers), (*Communication theory, Harmonic analyzers), Speech compression, Acoustic equipment, USSR

The proposed device is distinguished from the known ones by the fact that in it there is used an LC-line of delay which is open at the end and matched in the beginning, is of the low-frequency type, has branches, and is connected with a conversion system. The latter consists of linear detectors and summators arranged ahead of and behind the linear detectors in each branch of the delay line and terminated in low-frequency filters. This difference supposedly assures the obtaining of voltages proportional to the coefficients of the breaking down of the instantaneous spectrum into Fourier's cosine series.

**AD-625 315 Fld. 20/1, 20/14**
**CFSTI Prices: HC $1.00 MF $0.50**
*MICROWAVE LAB STANFORD UNIV CALIF*
**RESEARCH ON SELECTED MICROWAVE PROPERTIES OF FERRITES.**
Final rept. 1 Apr 62-28 Feb 65,
by H. J. Shaw. Aug 65, 25p. Rept. no. ml-1343
Contract AF19 (628)-342 Proj. AF-4600 Task 460003
AFCRL 65-665
Unclassified report

Descriptors: (*Ferromagnetic materials, Microwave equipment), Yttrium compounds, Iron compounds, Garnet, Zinc compounds, Nickel, Films, Sapphires, Rutile, Ferrites, Acoustics, Microwave frequency, Deflection, Transducers, Resonators, Harmonic generators, Dielectrics, Acoustic properties

Controlled steering of a microwave acoustic beam in a ferrite was demonstrated in a YIG rod, where the direction of an acoustic beam was varied by varying the magnitude of a dc magnetic field applied at an angle to the rod axis. Analysis has been made of the frequency passband characteristics of multiple film acoustic transducers for microwave frequencies. The theory of microwave dielectric resonators without conducting walls has been developed, and experimental results on the principal circuit properties of rutile resonators have been obtained. A theory has been developed for mechanisms contributing to the excitation of phonon instabilities in ferrites. A theory has been developed for the coupling efficiency of ferrite disks as magnetostrictive acoustic transducers. Experimental investigations of nickel film magnetostrictive transducers have been performed. Measurements have been made of acoustic attenuation at room temperature in sapphire and rutile, which have disclosed that these materials offer low loss acoustic wave transmission at microwave frequencies. Theoretical and experimental investigations of second harmonic generation in ferrites have established the upper bounds on conversion efficiency for low loss ferrites.

**AD-624 879 See Fld. 20/9**

**AD-624 926 See Fld. 14/2**

**AD-625 084 See Fld. 20/14**

**AD-625 086 See Fld. 20/4**

**AD-625 087 See Fld. 20/4**

**AD-625 088 See Fld. 20/14**

**AD-625 104 See Fld. 17/2**

**AD-625 232 See Fld. 17/1**

**AD-625 332 See Fld. 1/3**

**AD-625 471 See Fld. 20/12**

## 20/2. CRYSTALLOGRAPHY

**AD-624 877 Fld. 20/2, 11/6**
*ILLINOIS UNIV URBANA DEPT OF PHYSICS*
**NONEQUILIBRIUM SITUATIONS INVOLVING VACANCIES IN GOLD,**
by J. S. Koehler, and C. Lund. 1963, 13p.
Unclassified report

Supported in part by ONR.

*Availability: Published in Lattice Defects in Quenched Metals, p1-13 1965. Copies to DDC users only.*

Descriptors: (*Crystal lattice defects, Gold), (*Gold, Annealing), Quenching, Metallic crystals, Symmetry (Crystallography), Gold alloys

Contents: The annealing of quenched gold; Vacancy generation in pure and alloyed gold; Rapid vacancy generation at large subsaturation; The annealing out of tetrahedra.

**AD-624 961 Fld. 20/2**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE CHEMISTRY*
**ON THE LINEAR DIELECTRIC PROPERTIES OF FINITE IONIC CRYSTALS,**
by J. Grindlay. 11 Jan 65, 14p. Rept. no. nrc-8551
Unclassified report

*Availability: Published in Canadian Journal of Physics v43 p1604-15 Sep 1965. Copies to DDC users only.*

Descriptors: (*Dielectric properties, Crystals), Ions, Relaxation time, Crystal lattices, Vibration, Surface properties

The basic equations for determining the linear dielectric constants of a finite ionic crystal with arbitrary basis are derived and shown to be equivalent to those obtained by Born and Huang for an infinite crystal. The derivation is based on the assumption that the relaxation of the interionic spacing at the surface of the crystal merely extends over a few layers of ions. The approach used in these calculations is extended to the description of certain longwavelength oscillations with shape-dependent frequencies. (Author)

**AD-625 023 Fld. 20/2, 20/12, 11/6**
**CFSTI Prices: HC $6.00 MF $1.25**
*STANFORD UNIV CALIF DEPT OF MATERIALS SCIENCE*
**SOME ASPECTS OF DISLOCATION DYNAMICS IN METALS AND THE INFLUENCE OF DISLOCATION DISTRIBUTION ON LOW TEMPERATURE ELECTRICAL TRANSPORT PROPERTIES,**
by Troy W. Barbee Jr.. Nov 65, 230p. Rept. no. su-DMS-65-33 ,TR-17
Contract Nonr-225 (34) Proj. NR-031-577
Unclassified report

Descriptors: (*Crystal lattice defects, Metals), (*Tantalum, Crystal lattice defects), Resistance (Electrical), Molybdenum, Iron alloys, Silicon alloys, Copper, Aluminum, Electron microscopy, Single crystals, Lithium compounds, Fluorides, Cryogenics, Strain hardening, Deformation, Dynamics, Relaxation, Stresses, Strain (Mechanics)

The relationship between dislocation dynamics and strain hardening was investigated in polycrystalline Ta, Mo, Fe-Si, Cu, Al and single crystal LiF by determining the strain dependence of the dislocation velocity exponent m, using the macroscopic stress-relaxation technique. Dislocation structures in tantalum resulting from deformation to various values of strain at room temperature, deformed at temperatures between 400 and 1000 C, and deformed at room temperature and annealed at temperatures between 400 and 1200 C were examined by transmission electron microscopy techniques. The relationship between dislocation distribution and the low temperature electrical transport properties of metals was also investigated. The effect of dislocation distribution on the properties of high field superconductors was also considered. Calculations were made in which the effects of the strain fields of individual dislocations and the effects of dislocation distribution on the spatial variation of the conduction electron mean free path on the properties of Type I and Type II superconductors were considered.

**AD-625 075 Fld. 20/2, 7/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**STRUCTURE OF ORGANIC CRYSTALS.**
Bibliography,
by John Kourilo. 4 Dec 65, 41p. Rept. no. atd-65-77 .1
TT 65-64858
Unclassified report

Rept. on Surveys of Soviet Scientific and Technical Literature, covering open literature sources in 1963.

Descriptors: (*Organic compounds, Crystal structure), (*Crystal structure, Bibliographies), USSR

The bibliography of 109 entries is arranged by the following sections: general reviews, hydrocarbons, halogenated hydrocarbons, alcohols, esters, ketones and qunones, amines and amino acids, amides and imides, azo compounds, oxonium compounds, heterocyclic compounds, organometallic compounds, polymers. Corporate author, personal author, and subject indexes are included.

**AD-625 098 Fld. 20/2, 20/12**
*EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)*
**CONCENTRATION DEPENDENCE OF SPIN-LATTICE RELAXATION TIME OF COLOR CENTERS IN QUARTZ,**
by S. T. Wang, and G. W. Farnell. 22 Jun 65, 3p.
Unclassified report

*Availability: Published in Canadian Journal of Physics, v43 p1919-21 Oct 1965. Copies to DDC users only.*

Descriptors: (*Quartz, Color centers), (*Relaxation time, Color centers), Crystal lattices, Spin, Canada

**AD-625 249 Fld. 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**MOSAIC STRUCTURE OF METALLIC POLYCRYSTALS AND EXTINCTION EFFECTS,**
by I. A. Zazovskaya, and O. N. Shivrin. 15 Dec 65, 12p. Rept. no. ftd-TT-65-1289
TT 66-60055
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n6 p95-9 1963.

Descriptors: (*Metallic crystals, Crystal structure), (*X-ray diffraction analysis, Metallic crystals), Tungsten, Powder metals, Molybdenum, Copper, Light transmission, Scattering, USSR

In radiations of molybdenum and copper there were studied the extinction effects in the case of large- and small-grained powders of tungsten. It was established that the extinction weakens in proportion to the shortening oof the length of the radiation wave. An explanation of this phenomenon based on the proposition as to the optical character of the scattering of the X-rays by a mosaic crystal. (Author)

**AD-625 294 Fld. 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EFFECT OF GAMMA RADIATION ON THE FLUORESCENT YIELD OF RUBY,**
by S. V. Starodubtsev, and M. Yunusov. 3 Dec 65, 10p. Rept. no. ftd-TT-65-1074
TT 66-60072
Unclassified report

Unedited rough draft trans. of Akademiya Nauk Uzbekskoi SSR, Tashkent. Izvestiya. Seriya FizikoMatematicheskikh Nauk, v9 n1 p111-2 1965.

Descriptors: (*Ruby, Gamma rays), (*Fluorescence, Ruby), (*Ruby, Fluorescence), Electromagnetic waves, Color centers, Crystal lattice defects, Crystals, USSR

Centers of coloration formed on radiating ruby with gamma rays are shown to have no apparent contribution to its luminescence: nonradiating transitions predominate, the centers possibly extinguishing luminescence, reducing its yield. The appearance of such centers is regarded as being connected with the presence of impurities. The centers are found in the form of occlusions, and they create local defects in the crystals. Radiation of these defects causes localization of the defects or holes.

**AD-625 421 Fld. 20/2, 14/2**
**CFSTI Prices: HC $1.00 MF $0.50**

*HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND APPLIED PHYSICS*

**PROGRESS REPORT NO. 2, SEPTEMBER 1, 1964 SEPTEMBER 1, 1965,**

by David Turnbull. Sep 65, 7p. Contract Nonr-1866 (50) Proj. NR-032-485

Unclassified report

See also AD-608 761.

Descriptors: (*Ceramic materials, Crystallography), (*Crystallography, Reports), Crystallization, Boron compounds, Oxides, Silicon compounds, High-pressure research, X-ray diffraction analysis, Melting, Crystals, Reaction kinetics, Crystal growth, Crystal structure, Phase studies, Glass

Topics include: Crystallization of B2O3 under pressure; Crystallization of SiO2 under pressure; Hot stage for x-ray diffraction of ceramic systems; Melting of B2O3 crystals; Kinetics of devitrification of fused silica; Growth and melting of crystals of GeO2; Structure and phase separation in thin sections of silica base glasses.

**AD-625 546 Fld. 20/2, 7/4**

*PITTSBURGH UNIV PA*

**INTERPRETATION OF THE SOFT X-RAY EMISSION SPECTRUM OF LITHIUM METAL,**

by D. A. Goodings. 16 Mar 65, 14p. Contract AF-AFOSR-196-63 AFOSR 65-2204

Unclassified report

*Availability: Published in Proc. Phys. Soc. v86 p75-85 1965. Copies to DDC users only.*

Descriptors: (*X-ray spectru, Lithium), (*Lithium, X-ray spectrum), Crystal lattice defects, Perturbation theory, Atomic energy levels, Quantum mechanics, Metallic crystals, Band theory of solids

The shape of the soft x-ray emission spectrum of lithium has been calculated in the Hartree-Fock approximation taking into account the fact that an atom about to emit a K x-ray is a point defect in the otherwise periodic potential of the lattice. The perturbation from the 1s hole was treated in the 'localized approximation' of the KosterSlater theory, its effect being expressed by a single parameter. Starting from Ham's calculated density-ofstates function and gradually increasing the strength of the perturbation one observes the formation of a resonance state (virtual bound state) and then a real bound state. For reasonable values of the perturbation parameter the results show a peak about 1 eV below the Fermi energy, a feature which resembles the measurements of Crisp and Williams and others. The calculations also provide a plausible explanation of the measurements of Catterall and Trotter on the satellite K emission spectrum of lithium. (Author)

**AD-624 954** See Fld. 14/2

**AD-624 981** See Fld. 20/12

**AD-625 013** See Fld. 20/3

**AD-625 154** See Fld. 11/6

**AD-625 166** See Fld. 20/12

**AD-625 169** See Fld. 20/12

**AD-625 176** See Fld. 7/3

**AD-625 211** See Fld. 7/4

**AD-625 310** See Fld. 9/5

**AD-625 311** See Fld. 20/6

**AD-625 411** See Fld. 7/4

**AD-625 539** See Fld. 20/3

**AD-625 550** See Fld. 20/12

**AD-625 568** See Fld. 20/11

**AD-625 639** See Fld. 7/4

**AD-625 643** See Fld. 7/4

## 20/3. ELECTRICITY AND MAGNETISM

**AD-624 878 Fld. 20/3, 20/12, 20/5**

*MASSACHUSETTS INST OF TECH CAMBRIDGE*

**MAGNETIC PROPERTIES OF INAS DIODE ELECTROLUMINESCENCE,**

by F. L. Galeener, I. Melngailis, G. B. Wrightand , and R. H. Rediker. 12 Oct 64, 6p.

Unclassified report

*Availability: Published in Journal of Applied Physics, v36 n5 p1574-9 May 1965. Copies to DDC users only.*

Descriptors: (*Electroluminescence, Diodes (Semiconductor)), (*Diodes (Semiconductor), Magnetic properties), Indium alloys, Arsenic alloys, Lasers, Magnetic fields, Band theory of solids, Antimony alloys

Spontaneous and laser electroluminescence of InAs diodes have been studied in magnetic fields up to 109 kG. The peak of the emitted energy shifts linearly with magnetic fields above 20 kG at a rate which depends on the carrier concentration of the n-type base material. If the energy shift is described as 1/4heH/pi m*c, the value of m* is the same as that measured at the Fermi livel in bulk n-type material. The emission from one laser diode exhibited a splitting which corresponds to a g factor of about 7 for the electron. Evidence was obtained that the laser threshold current is reduced by the component of magnetic field perpendicular to the junction current. (Author)

**AD-625 013 Fld. 20/3, 20/2**

*AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO*

**SWITCHING BEHAVIOR OF FERROELECTRIC Bi4Ti3O12.**

Technical rept.,

by S. E. Cummins. 6 Jan 65, 7p. Rept. no. AFAL-TR-65-252

Unclassified report

*Availability: Published in Journal of Applied Physics v38 n6 p1958-62 Jun 1965. Copies to DDC users only.*

Descriptors: (*Ferroelectric crystals, Field theory), (*Bismuth compounds, Titanates), Hysteresis, Single crystals, Polarization, Relaxation time

The switching behavior of single-crystal ferroelectric Bi4Ti3O12 was determined at room temperature. The switching time for fields from 4 to 14 kV/cm can be expressed as t = 0.00132 exp (61.6 (kV/cm)/E) micro sec. For fields in the range 3 to 4 kV/cm, partial switching occurs; for fields less than 3 kV/cm, switching does not occur. In the region of exponential dependence, t was measured as a function of E by the direct observation of switching current pulses. For fields in the region of incomplete switching, the behavior was determined by measuring the fraction of polarization reversal as a function of field for different voltage pulse widths. A family of curves with pulse widths ranging from 100 micro sec to 5 h clearly shows a switching threshold at a field of approximately 3 kV/cm. Oscilloscope photographs reveal initial hysteresis loops that possess a field axis bias which rapidly anneals to give a nearly symmetrical loop. The dependence of switching time on the frequency of the applied switching voltage indicates that the bias effect has a relaxation time extending from less than 5msec to several minutes or longer. The unusual switching properties are explained in terms of the rapidly changing bias. The source of the internal bias is not determined in this investigation. (Author)

**AD-625 273 Fld. 20/3**

**CFSTI Prices: HC $1.00 MF $0.50**

*DELAWARE UNIV NEWARK DEPT OF PHYSICS*

**THE INSTABILITY OF NEGATIVE DIFFERENTIAL RESISTANCE.**

Technical rept.,

by K. W. Boer. Dec 65, 10p. Rept. no. tr-4 Contract Nonr-4336 (00)

Unclassified report

Descriptors: (*Resistance (Electrical), Stability), Thermodynamics, Field theory, Crystals, Electric currents, Voltage, Power

It is shown that the mathematical expression of the thermodynamic restriction on the power generated as a consequence of negative differential resistance in crystals given by Ridley (Proc. Phys. Soc., 82, 954 (1963).) is incorrect. The appropriate relation is derived, and the influence of the formation of layer-like field domains on the possibility of stabilizing such regions is discussed.

**AD-625 312 Fld. 20/3**

**CFSTI Prices: HC $3.00 MF $0.75**

*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*

**PHOTOIONIZATION IN GASES.**

Comprehensive rept.,

by Charles Shishkevish. 6 Dec 65, 68p. Rept. no. atd-65-91 2

TT 66-60084

Unclassified report

Rept. on Surveys of Soviet Scientific and Technical Literature, covering material pub. Jan 63-Apr 65. See also AD-434 295.

Descriptors: (*Ionization potentials, Measurement), (*Photoelectric effect, Gas ionization), Absorption, Atomic spectroscopy, Helium group gases, Helium, Organic compounds, Ethanols, Methane, Air, Mass spectroscopy, Aromatic compounds, Amines, Ions, Alkali metals, State-of-the-art reviews, USSR

Contents: Experimental research on photoabsorption from the ground states of atoms and molecules; Experimental research on photoionization and photodissociation of organic compounds; Photoionization of positive ions and photoionization from excited states of atoms; Photodetachment.

**AD-625 362 Fld. 20/3**

**CFSTI Prices: HC $3.00 MF $0.75**

*POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST*

**MODAL ANALYSIS AND SYNTHESIS OF ELECTROMAGNETIC FIELDS.**

Research rept.,

by L. B. Felsen, and N. Marcuvitz. 5 Aug 65, 70p. Rept. no. pibmri-1257-65

Contract AF19 (628)-4324 Proj. AF-4600 Task 460004

AFCRL 65-668

Unclassified report

Descriptors: (*Electromagnetic fields, Synthesis), Fourier analysis, Transients, Cerenkov radiation, Diffraction, Dielectrics, Waveguides, Optics, Space charges, Field theory

After a general discussion of non-harmonic electromagnetic processes from the viewpoint of temporal Fourier (or Laplace) analysis and synthesis, a class of problems is considered for which the transient solution may be recovered in simple form. Included in this category are pulsed point, line and plane wave sources in free space, and in the presence of (a) a dielectric half-space, (b) a perfectly absorbing or perfectly conducting wedge or half plane, and (c) a unidirectionally conducting infinite and semi-infinite screen. Explicit expressions for the transient response, found by a systematic application of the modal procedures discussed in earlier chapters in this sequence, are in-

terpreted in physical terms. Attention is then given to a second class of problems wherein an electric charge moves uniformly along a straight trajectory in various environments. The associated radiation is now of the Cerenkov type, and formulas for the fields as well as the radiated power are given. (Author)

**AD-625 486 Fld. 20/3, 20/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*GENERAL ELECTRIC CO SCHENECTADY N Y RESEARCH AND DEVELOPMENT CENTER*
**EFFECTS OF PRESSURE ON MAGNETIC INTERACTIONS.**
Final rept. 1 Aug 64-31 Oct 65,
by J. S. Kouvel, and C. R. Morgan. Dec 65, 10p.
Contract Nonr-3893 (00)
Unclassified report

Descriptors: (*Magnetic properties, Pressure), (*Compressive properties, Magnetic properties), Ferromagnetism, Antiferromagnetism, Resistance (Electrical), Thermodynamics, Entropy, Rhodium alloys, Iron alloys

A hydrostatic-pressure furnace system was designed, constructed, and assembled, and then tested at pressures up to about 10 kb. With this system, initial measurements were made at various fixed pressures of the critical temperature for the abrupt antiferromagnetic-ferromagnetic transition in the ordered alloy FeRh. The critical temperature, which is marked by a large sudden change in resistivity, was observed to increase rapidly with increased compression. This pressure dependence was then used quantitatively in evaluating the entropy change associated with the transition. The value thus obtained for the change in entropy agrees fairly closely with that recently deduced from the measured variation in critical temperature with applied magnetic field. Some discrepancy does exist, however, between these results and those previously derived form similar measurements. A fuller account of the pressure experiments with FeRh is given.

**AD-625 539 Fld. 20/3, 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYRACUSE UNIV N Y DEPT OF PHYSICS*
**ANTIFERROMAGNETIC SPIN RESONANCE OF COBR2.6H20,**
by T. Murray, and G. Wessel. 27 Dec 65, 7p.
Rept. no. tr-3
Contract Nonr-669 (18) Proj. NR-014-407
Unclassified report

Descriptors: (*Electron spin resonance, Cobalt compounds), (*Cobalt compounds, Bromides), (*Antiferromagnetism, Electron spin resonance), Field theory, Single crystals, Crystal structure, Cryogenics

Electron spin resonance experiments were carried out on single crystals of CoBr2.6H20 at temperatures from 1.2 to 4.2K, using a microwave transmission spectrometer over a range of frequencies from 29 to 59 kMc.

**AD-624 981 See Fld. 20/12**

**AD-624 998 See Fld. 20/9**

**AD-625 105 See Fld. 20/12**

**AD-625 268 See Fld. 20/9**

**AD-625 292 See Fld. 13/1**

**AD-625 429 See Fld. 20/9**

**AD-625 548 See Fld. 20/8**

**AD-625 559 See Fld. 20/8**

**AD-625 568 See Fld. 20/11**

## 20/4. FLUID MECHANICS

**AD-624 862 Fld. 20/4**
*HARVARD UNIV CAMBRIDGE MASS DEPT OF MATHEMATICS*
**FREE BOUNDARY PROBLEMS FOR VISCOUS FLOWS IN CHANNELS,**
by Garrett Birkoff. 1964, 21p.
Unclassified report

*Availability: Published in Cavitation in Real Liquids p102-21 1964. Copies to DDC users.*

Descriptors: (*Lubricants, Fluid flow), (*Boundary value problems, Fluid flow), Cavitation, Flow separation, Viscosity, Films, Cylindrical bodies, Rotation, Journal bearings, Fluid dynamic properties

The paper concerns the longitudinal penetration by air of a cylindrical tube filled with a viscous fluid, and the cavitation and flow separation which occurs in lubricating films between two rotating cylinders. These phenomena are discussed from a mathematical standpoint.

**AD-624 933 Fld. 20/4, 8/3, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL RESEARCH LAB WASHINGTON D C*
**THE DAMPING OF CAPILLARY WAVES AT THE AIR/ WATER INTERFACE BY NATURALLY OCCURRING SURFACE-ACTIVE MATERIAL.**
Interim rept.,
by W. D. Garrett. 19 Oct 65, 15p. Rept. no. nrl-6337
Proj. RUDC-4B-000/652-1/F001-99-01
Unclassified report

Descriptors: (*Water waves, Damping), (*Surfaceactive substances, Water waves), Monomolecular films, Adsorption, Pressure, Drag, Mass transport

The damping of capillary waves was measured on fresh sea water, sampled from the Bay of Panama under various oceanographic conditions. The collected water contained varying quantities of surface-active organic materials capable of adsorbing at the air/water interface and altering the surface properties. Agitation, thermal currents, and bubbling were studied as mechanisms for the transport of film-forming material from the bulk water to the surface. Large increases in the rate of film accumulation occurred when these mechanisms were applied. Simultaneous measurements of damping coefficient and film pressure indicated that wave damping commenced at a film pressure of a few tenths of 1 dyne/cm and increased to a maximum value of from 0.39 to 0.44/cm in the neighborhood of 1 dyne/cm. As the film pressure was increased further by compression of the surface film, the damping coefficient decreased to a value of about 0.26/cm and became constant when the film pressure had reached 2 dynes/cm. It was postulated that a portion of the wave energy loss was due to a viscous drag of the associated chains of water molecules which were bonded to the molecules of the adsorbed surface film. The drag occurs when the molecules are forced into movement as a result of the alternating compression and expansions of the surface caused by the passing progressive waves. (Author)

**AD-624 984 Fld. 20/4, 20/13**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE PHYSICAL LAB*
**STABILITY OF A HOMOGENEOUS FLUID COOLED UNIFORMLY FROM ABOVE,**
by Theodore D. Foster. 27 Apr 64, 10p. Rept. no. MPL-U-22/64
Contract Nonr-2216 (05)
Unclassified report

*Availability: Published in The Physics of Fluids v8 n7 p1249-57 Jul 1965. Copies to DDC users only.*

Descriptors: (*Convection (Heat transfer), Fluid flow), (*Fluid flow, Convection (Heat transfer)), Incompressible flow, Stability, Mathematical models, Differential equations, Fluid mechanics

The stability of an initially homogeneous layer of fluid which is cooled uniformly from above is examined. A simplified mathematical model in which the velocity and temperature perturbations vanish at the top and bottom boundaries but which takes into account nonlinear, timedependent temperature profiles is developed. Solution of the stability equation is achieved by expanding the velocity perturbation in a Fourier sine series with time dependent coefficients and solving the resulting system of couples differential equations numerically. The initial behavior of the system is found to depend upon the Rayleigh and Prandtl numbers. For large Rayleigh numbers the time needed for the system to manifest convective behavior is independent of the depth of the fluid layer but depends on the rate and manner of cooling and on the properties of the fluid. For large Rayleigh numbers, the horizontal wavenumber of disturbances which are amplified the most when convective behavior is manifest in the system also is independent of the depth of the fluid layer but depends on the rate and manner of cooling and on the properties of the fluid. (Author)

**AD-625 037 Fld. 20/4**
**CFSTI Prices: HC $4.00 MF $1.00**
*ILLINOIS UNIV URBANA DEPT OF THEORETICAL AND APPLIED MECHANICS*
**A STUDY OF TURBULENT FLOW IN ROUGH PIPES.**
by J. M. Robertson, T. H. Burkhart, and J. D. Martin. May 65, 142p. Rept. no. t/am-279
Contract Nonr-1834 (32) Proj. SR009-01-01
Unclassified report

Descriptors: (*Pipes, Fluid flow), (*Turbulence, Fluid flow), Roughness, Surface properties, Friction

The considerable literature on turbulent flow past rough surfaces is correlated in terms of modes of presenting the smooth-to-rough transition and the influences of roughness density and shape. Flow measurements in a 3 in. smooth and sand roughened pipe and in an 8 in. steel pipe with 'natural' roughness are reported. The temporal-mean velocity and friction measurements show transitional (between smooth and fully rough behavior) variations. The pipe factor variation is also elucidated; the sand-roughened pipe studies indicate a shift in Nikuradse's presentation. The turbulence - as intensity divided by shear velocity and macroscale in ratio to pipe radius - in rough pipe flow appears the same in rough as in smooth pipe flow. The relative turbulence intensity is constant, or at most decreases slowly with increase in flow Reynolds number. (Author)

**AD-625 056 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**AERODYNAMICS AND HEAT TRANSFER OF A FLAT TURBULENT STREAM FLOWING ALONG A FLAT SURFACE,**
by A. L. Kuznetsov, and A. V. Sudarev. 17 Dec 65, 17p. Rept. no. ftd-TT-65-1030
TT 65-64840
Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v10 n6 p8-11 1964.

Descriptors: (*Turbulence, Fluid mechanics), Aerodynamic characteristics, Heat transfer, Surfaces, Boundary layer, Jets, USSR

**AD-625 058 Fld. 20/4, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**

*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**DIFFERENTIAL METHOD FOR THE NUMERICAL SOLUTION OF TWO DIMENSIONAL NONSTATIONARY NAVIER-STOKES EQUATIONS FOR A COMPRESSIBLE GAS,**
by I. Yu. Brailovskaya. 8 Dec 65, 11p. Rept. no. ftd-TT-65-1107
TT 65-64842

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady, v160 n5 p1042-5 1965.

Descriptors: (*Gas flow, Numerical analysis), (*Numerical methods and procedures, Partial differential equations), Two-dimensional flow, Compressible flow, USSR

**AD-625 060 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**FORCED OSCILLATIONS OF A STREAM OF AN IDEAL COMPRESSIBLE LIQUID IN A HOMOGENEOUS STRAIGHT PIPE,**
by K. S. Kolesnikov. 8 Dec 65, 18p. Rept. no. ftd-TT-65-1119
TT 65-64844

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie n4 p102-7 1963.

*Distribution: No limitation.*

Descriptors: (*Compressible flow, Oscillation), (*Pipes, Compressible flow), Fluid flow, USSR, Mathematical analysis

**AD-625 065 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PASSAGE OF AN UNBALANCED GAS THROUGH THE CRITICAL SECTION OF A NOZZLE,**
by A. S. Pleshanov. 8 Dec 65, 14p. Rept. no. FTD-TT-65-1134
TT 65-64849

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady, v158 n1 p74-7 1964.

Descriptors: (*Nozzle gas flow, Equations), Frozen equilibrium flow, Hydrodynamics, USSR

A solution is given in the first two approximations for the minor relaxation parameters the equations of hydrodynamics, taking into account the processes for stationary flows of an unbalanced gas in the region of the critical section of the nozzle and the states: (1) close to the balanced, (2) close to the completely unbalanced ('frozen'). (Author)

**AD-625 085 Fld. 20/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**A HYDRAULIC ANALOG STUDY OF THE HARTMANN OSCILLATOR PHENOMENON,**
by Louis Solomon. Oct 65, 69p. Rept. no. 65-46
Contract Nonr-233 (62)

Unclassified report

Descriptors: (*Oscillation, Fluid mechanics), (*Jets, Fluid dynamic properties), Hydraulic systems, Models (Simulations), Gas flow, Flow visualization, Partial differential equations

The paper describes the construction of a water channel and its use for the investigation of the hydraulic analog of the Hartmann oscillator problem. Continuous 'shooting' water flow was found to be analogous to supersonic isentropic gas flow; a static depth of approximately one quarter-inch of water appeared to be satisfactory with this channel. Measurements were of two types: direct measurement of the height of the free surface, and measurement obtained through photographic records. Quantitative agreement between hydraulic jumps and shock waves was not obtained; this was not expected due to the theory given in the text. Qualitative features of the flow were reproduced and agreed well with the observations made with the cavity in the air stream. For research purposes, it seems that the most valuable aspect of 'the hydraulic analogy is its ability to easily present excellent flow visualization of flow phenomena which are not well understood. Furthermore, its usefulness as a teaching aid for the subject of fluid mechanics seems obvious. (Author)

**AD-625 086 Fld. 20/4, 20/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**A STUDY OF SOME ASPECTS OF JET FLOWS AND EDGE-TONES,**
by Madan M. Oberai. Nov 65, 27p. Rept. no. 65-50
Contract Nonr-233 (62)

Unclassified report

Descriptors: (*Noise, Aerodynamic characteristics), (*Jets, Noise), Two-dimensional flow, Acoustics, Fluid flow, Oscillation, Frequency

The study concerns the phenomenon of edge-tones and of those aspects of jet-flows that are relevant to the study of edge-tones. The object of the report is to present, in a synthetic form, the results of some important classical and recent works on the subject with a view to facilitate further research in this field. A few comments are added on certain points that need attention of researchers in this area. (Author)

**AD-625 087 Fld. 20/4, 20/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**FLUID MOTION AND SOUND.**
Final rept. 1 May 59-31 Oct 65,
by Louis Solomon. Nov 65, 11p. Rept. no. 65-49
Contract Nonr-233 (62)

Unclassified report

Descriptors: (*Sound, Aerodynamic characteristics), (*Fluid flow, Sound), Jets, Frequency, Bibliographies, Abstracts, Acoustics

**AD-625 187 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**HYDRODYNAMIC RESISTANCE AND HEAT TRANSFER OF A HOUSED DISK WITH RADIAL FLOW IN THE GAP,**
by N. I. Nikitenko. 30 Nov 65, 10p. Rept. no. ftd-TT-65-1136
TT 66-60031

Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Energetika (USSR) n9 p49-53 1964.

Descriptors: (*Disks, Fluid dynamic properties), Drag, Heat transfer, Turbines, Vortices, USSR, Stresses, Friction, Defects (Materials)

**AD-625 205 Fld. 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF*
**EXPERIMENTAL AND ANALYTICAL STUDIES IN CONTINUUM HYPERSONIC FLOW.**
Final rept., 1 Jul 64-30 Jun 65,
by Ting Yi Li, Arnold Polak, Philip Kirk, and Joseph Loch. Sep 65, 27p. Contract AF33 (616)-8453 Proj. AF-7064 ARL 65-183

Unclassified report

Descriptors: (*Hypersonic flow, Reviews), Boundary layer, Stability, Continuum mechanics, Mechanical properties, Delta wings, Hypersonic wind tunnels

The analytical studies in continuum hypersonic flow carried out are reviewed and summarized in the present report. Also summarized is the progress made in the originally envisaged investigation of torsion-rod flexures for dynamic stability tests in hypersonic wind tunnels. The theoretical studies include investigations into inviscid hypersonic flow, hypersonic viscous-inviscid interaction, and binary boundary layer flows. (Author)

**AD-625 207 Fld. 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*NEW YORK UNIV N Y*
**ON THE INITIAL CONDITIONS FOR BOUNDARY LAYER EQUATIONS,**
by Lu Ting. Oct 65, 33p. Contract AF33 (615)-2215 Proj. AF-7064 ARL 65-208

Unclassified report

Descriptors: (*Boundary layer, Equations), Threedimensional flow, Enthalpy, Momentum, Velocity, Density

A three dimensional boundary layer with two components of velocity, v, w, much smaller than the third component, u, which is along the inviscid stream line, the x-coordinate, is studied. It is shown that the boundary layer equations lead to a compatibility equation on the four initial data of the three velocity components and the density, while the enthalpy is related to density by the equation of state. When the four initial data prescribed at a station, $x = 0$, are inconsistent with the compatibility equation, the solution in a thin initial strip near $x = 0$ will not fulfill the usual boundary layer equations. In this thin initial strip, a new set of governing equations are derived by stretching all three coordinates. By the examination of the general properties of the solutions in the thin strip and by the standard matching procedures, it is shown that the three proper initial conditions to be imposed on the boundary layer equations are the density profile, the velocity component u and a third quantity which is neither v nor w but a combination of the four prescribed initial data. An alternate derivation of these proper initial conditions and their physical interpretation is presented by the direct balance of mass, momentum and energy across the thin initial strip. (Author)

**AD-625 236 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ANALYSIS OF FLOW NEAR A BLUNT SOLID OF REVOLUTION AT ANGLE OF ATTACK IN SUPERSONIC FLOW OF GAS,**
by A. N. Minailos. 30 Nov 65, 15p. Rept. no. ftd-MT-64-482
TT 66-60044

Unclassified report

Edited Machine trans. of Zhurnal Vychislitel noi Matematiki i Matematicheskoi Fiziki (USSR) v4, n1 p171-7 1964.

*Availability: Copies to DDC users only.*

Descriptors: (*Blunt bodies, Supersonic characteristics), (*Bodies of revolution, Supersonic characteristics), Supersonic flow, Angle of attack, USSR, Integral equations, Shock waves, Analysis

A solution is given to the forward problem using integral relations with interpolation with respect to two variables.

**AD-625 243 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**PERTURBATIONS OF SUPERSONIC FLOW CAUSED BY DISCRETE OR CONTINUOUSLY DISTRIBUTED HEAT AND MASS FLOWS,**
by N. D. Kovalenko. 14 Dec 65, 8p. Rept. no. ftd-TT-65-1619
TT 66-60049
Unclassified report

Unedited rough draft trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) n5 p684-6 1965.

Descriptors: (*Supersonic flow, Turbulence), (*Transport properties, Supersonic flow), Mass transfer, Heat transfer, USSR, Distribution, Combustion, Fuels, Mathematical analysis

**AD-625 289 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**HYDRAULIC RESISTANCE AND HEAT AND MASS TRANSFER IN A VORTICAL FLOW,**
by R. Z. Alimov. 19 Oct 65, 19p. Rept. no. ftd-TT-65-937
TT 66-60067
Unclassified report

Unedited rough draft trans. of Teploenergetika (USSR) n3 p81-5 1965.

Descriptors: (*Vortex generators, Transport properties), Mass transfer, Heat transfer, Drag, Hydraulic systems, USSR, Vortices, Temperature

The article introduces the results of experimental investigation of heat and mass transfer at different degrees of vorticity of a flow applicable to a tube 200 mm in diameter and 2m long. (Author)

**AD-625 361 Fld. 20/4, 14/2**
*POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA*
**ON THE TURBULENCE DEVELOPMENT IN THE BOUNDARY LAYER WITH PRESSURE GRADIENT.**
Technical note and scientific rept.,
by Ennio Mattioli. Jul 65, 41p. Rept. no. tn-30 ,Scientific-6
Contract AF-EOAR-98-63 AFOSR 65-2187
Unclassified report

*Availability: Published in Istituto di Meccanica Applicata del Politecnico di Torino as Technical note 30. Copies to DDC users only.*

Descriptors: (*Boundary layer transition, Turbulence), Pressure, Wind tunnels, Flate plate models, Theory, Experimental data, Fluid mechanics, Italy

The research includes: (1) a theoretical-experimental research on working of the pressure gradient wind tunnel (which was especially built for this purpose); (2) speed and turbulence intensity measurements in the boundary layer of a flat smooth plate, with different values of pressure gradient, or in the presence of turbulence in the undisturbed stream; (3) a study of the variations of displacement thickness, momentum loss thickness, shape parameter; (4) speed fluctuation recording within the boundary layer during the transition; (5) control of the whole phenomenon by means of the china-clay method. Conclusions are drawn about the disturbed boundary, origin and nature of the transition, modification of the shape parameter. (Author)

**AD-625 384 Fld. 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF*
**EXPERIMENTAL INVESTIGATIONS OF HYPERSONIC FLOW AROUND TWO-DIMENSIONAL CIRCULAR CYLINDERS.**
Interim rept. Oct 63-Jun 64,
by K. H. Token, and H. Oguro. Oct 65, 38p.
Contract AF33 (616)-8453 Proj. AF-7064 ARL 65-212
Unclassified report

Descriptors: (*Cylindrical bodies, Hypersonic flow), (*Hypersonic flow, Cylindrical bodies), Two-dimensional flow, Wake, Base flow, Pressure, Boundary layer

The paper describes an experimental investigation of the flow phenomena about a two-dimensional circular cylinder in a hypersonic stream. The purpose of the investigation was to record properties of the flow regions which have a direct effect on the wake behind a twodimensional circular cylinder. All data were obtained at a nominal Mach number of 14 and a stagnation temperature of 1800R. The total pressure settings were between 600 and 2000 psia, although the majority of the data was taken at 1000, 1200, 1400, or 1600 psia. Model diameters varied from 1/4 to 3/4 inch, however tests about 3/8 and 1/2 inch diameter models were most common. Data concerning pressure distributions at the body, in the base flow region and near wake were obtained. In addition, some qualitative results were obtained with the hot wire anemometer at the body surface. (Author)

**AD-625 404 Fld. 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF*
**CALCULATION OF THE FORCE COEFFICIENT FOR DELTA WINGS IN HYPERSONIC FLOW.**
Interim rept. Apr 64-Jun 65,
by Arnold Polak. Sep 65, 43p. Contract AF33 (616)-8453 Proj. AF-7064 ARL 65-182
Unclassified report

Descriptors: (*Delta wings, Aerodynamic loading), (*Hypersonic characteristics, Delta wings), Mathematical analysis, Boundary layer, Aspect ratio, Pressure, Hypersonic flow

The results of the Newtonian theory as applied to a delta wing at moderate angles of attack in hypersonic stream are used to calculate the pressure coefficient by the inverse method in a closed form. (Author)

**AD-625 622 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV BERKELEY INST OF ENGINEERING RESEARCH*
**SPHERE DRAG AT HIGH KNUDSEN NUMBER AND LOW MACH NUMBER.**
Technical rept.,
by D. Roger Willis. Oct 65, 22p. Rept. no. as-65-16
Contract Nonr-222 (45) Grant ,NSF-GP-2520
Unclassified report

Descriptors: (*Spheres, Drag), Iterative methods, Mathematical models, Superaerodynamics, Molecular properties, Knudsen number

The drag of a sphere is calculated for the case of low Mach number and high Knudsen number. The method of Knudsen iteration is used to predict the drag correct to order of the inverse Knudsen number. The BhatnagerGross-Krook model is used to describe the intermolecular collision process. (Author)

**AD-625 656 Fld. 20/4**
*LOUISIANA STATE UNIV BATON ROUGE*
**EFFECT OF A CYLINDRICAL BOUNDARY ON THE ADDED MASS OF TWO CYLINDERS IN LIQUID HELIUM,**
by R. G. Hussey, and J. M. Reynolds. 4 Feb 65, 6p. Contract DA-ARO (D)-31-124-G423
AROD 4016:5
Unclassified report

*Availability: Published in The Physics of Fluids v8 n7 p1213-7 Jul 1965. Copies to DDC users only.*

Descriptors: (*Cylindrical bodies, Fluid dynamic properties), Weight, Kinetic energy, Liquefied gases, Helium

An expression is derived for the added mass of two equal circular cylinders (radius a) moving normal to the line of centers in an ideal fluid enclosed by a fixed cylindrical boundary (radius b). The two moving cylinders, with centers 2c apart, have velocities equal in magnitude but opposite in direction.

**AD-625 061 See Fld. 21/2**

**AD-625 064 See Fld. 14/2**

**AD-625 066 See Fld. 4/1**

**AD-625 095 See Fld. 20/13**

**AD-625 171 See Fld. 20/9**

**AD-625 206 See Fld. 12/1**

**AD-625 237 See Fld. 8/10**

**AD-625 253 See Fld. 14/2**

**AD-625 327 See Fld. 13/10**

**AD-625 405 See Fld. 14/2**

**AD-625 418 See Fld. 10/1**

**AD-625 517 See Fld. 20/11**

**AD-625 551 See Fld. 4/1**

**AD-625 566 See Fld. 19/4**

**AD-625 580 See Fld. 20/9**

## 20/5. MASERS AND LASERS

**AD-624 925 Fld. 20/5, 20/6, 9/5**
*COLUMBIA RADIATION LAB NEW YORK*
**THE EFFECTS OF OPTICAL PUMPING ON THE RB87 MASER OSCILLATOR.**
Technical rept.,
by P. Davidovits, and W. A. Stern. Oct 65, 20p. Rept. no. tr-3
Contract Nonr-4259 (10) Proj. NR-373-250
Unclassified report

*Availability: Published in Proceedings of the Annual Symposium on Frequency Control (19th), Atlantic City, N. J. 20-22 Apr 65. Copies to DDC users only.*

Descriptors: (*Masers, Pumping (Optical)), (*Pumping (Optical), Masers), (*Rubidium, Masers), (*Oscillators, Masers), Quantum mechanics, Atomic energy levels, Oscillation, Optics, Frequency, Standards

The effects of optical pumping on the Rb87 maser oscillator were studied. The optical pumping efficiency was measured. The oscillator power output and the oscillator frequency change as a function of pumping light parameters were determined. Methods for reducing the frequency instabilities caused by the pumping light are discussed. (Author)

**AD-624 935 Fld. 20/5, 20/12, 20/6**
**CFSTI Prices: HC $3.00 MF $0.75**
*NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF*
**GAAS INJECTION LASER INVESTIGATION.**
Technical progress rept. Dec 63-May 64,
by Donald G. McCauley. Oct 65, 60p. Rept. no. nots-TP-3655 ,TPR-377
Unclassified report

Descriptors: (*Lasers, Semiconductors), (*Semiconductors, Lasers), Solid state physics, Diodes (Semiconductor), Gallium compounds, Arsenides, Injection, Pumping (Optical), Light, Optics

This is one in a series of reports to be published on laser technique and application studies. It documents an investigation in which coherent light emission was obtained from a General-Electric Company GaAs p-n junction injection laser. With current densities in excess of 2,400 amp/sq cm, increased external quantum efficiency, spectral line narrowing, and a high degree of primary source coherence of the radiation were shown. The spectral distribution, which is highly dependent on the current-induced changes in the junction temperature during a single injection pulse, was recorded photographically using a new application of the pulsed-intensity oscilloscope technique. Infrared sheet film was exposed to the radiation below, near, and far above threshold resulting in no, a few, and a great many interference fringes, respectively. There is up to 50% error in the quantitative data presented here, which is not unusual for injection laser investigations; however, the qualitative trends toward spectral line narrowing and high external quantum efficiency support the argument for the optical pumping of neodymium glass and calcium fluoride lasers. (Author)

**AD-625 196 Fld. 20/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**AMMONIA MASER (AMMONIA MOLECULAR GENERATOR),**
by N. A. Begun, V. P. Egorov, V. V. Ilin, and V. E. Petrov. 27 Oct 65, 6p. Rept. no. ftd-TT-65-803
TT 66-60035
Unclassified report

Unedited rough draft trans. of Patent (USSR) 160 727, appl. no. 790507/26-9, 8 Aug 62.

Descriptors: (*Masers, Ammonia), (*Ammonia, Masers), Molecular beams, Generators, Resonators, Atomic energy levels, Patents, USSR

The object of the invention is an ammonia molecular generator with opposing beams which has the distinguishing feature that, for the purpose of lengthening the period of uninterrupted working through the means of avoiding the depositing of particles of the active substance of a highvacuum pump on the working surfaces of the highfrequency resonator, and simplification of the design of the generator through the exclusion of cryogenic substance, there are used extended multichannel pickups of the beams of the ammonia with six and eight-field sorting systems and heating of the high-frequency generator. (Author)

**AD-625 338 Fld. 20/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*KORAD CORP SANTA MONICA CALIF*
**LASER-PUMPED LASER.**
Semi-annual technical summary rept.,
by R. H. Hoskins, O. M. Cernichiari, B. McFarland, R. C. Pastor, and B. H. Soffer. 15 Nov 65, 26p. Contract Nonr-4877 (00) Proj. NR-015-625 ,DEFENDER
Unclassified report

Descriptors: (*Ruby, Pumping (Optical)), (*Lasers, Organic materials), (*Pumping (Optical), Lasers), Dyes, Fluorescence, Solutions, Phthalocyanines, Naphthalenes, Chlorine compounds, Cinchona alkaloids, Sulfates

Two approaches are being followed: search for a suitable material for pumping with 6943A ruby laser radiation and study of known materials pumped with 3472A second harmonic ruby laser radiation. This report presents progress on the use of metal-free phthalocyanine for the first approach and quinine sulphate for the second. Potential sources of trouble are analyzed. (Author)

**AD-624 872** **See Fld. 7/4**

**AD-624 878** **See Fld. 20/3**

**AD-625 020** **See Fld. 14/2**

**AD-625 038** **See Fld. 20/6**

**AD-625 090** **See Fld. 14/2**

**AD-625 166** **See Fld. 20/12**

## 20/6. OPTICS

**AD-624 947 Fld. 20/6, 20/10**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH*
**FUNDAMENTAL THEOREM IN QUANTUM OPTICS,**
by I. R. Senitzky. 12 May 65, 3p.
Unclassified report

*Availability: Published in Physical Review Letters v15 n6 p233-5 Aug 9 1965. Copies to DDC users only.*

Descriptors: (*Optics, Quantum mechanics), (*Quantum mechanics, Optics), Theorems, Vacuum, Perturbation theory, Electromagnetic fields, Emissivity

The concepts and formalism of quantum optics are greatly simplified by the following theorem: All sources on which the effect of the 'detector' is negligible may be treated as classical sources in the interaction under consideration, where 'detector' indicates the optical systems usually acted upon by a detector and a dissipation mechanism. The theorem has a corollary: The field acting on a quantum-mechanical system--when the sources are of the above type--consists of the superposition of a classical field and the 'vacuum' field. The term 'vacuum' field refers either to the true vacuum field in the absence of dissipation, or to the field due to the zero-point (and thermal, if pertinent) fluctuations of the dissipation mechanism, which replaces the true vacuum field, in the presence of dissipation. The total field referred to in the corollary is fully quantum mechanical. In the theorem and associated formalism there are clear separation of classical and quantum-mechanical effects of the optical field and an indication of the physical origin of each.

**AD-624 952 Fld. 20/6**
*ARMY ELECTRONICS LABS FORT MONMOUTH N J*
**SCATTERING PROPERTIES OF CONCENTRIC SOOTWATER SPHERES FOR VISIBLE AND INFRARED LIGHT,**
by Robert W. Fenn, and Hansjorg Oser. 18 Jan 65, 6p.
Unclassified report

*Availability: Published in Applied Optics, v4 n11 p1504 Nov 1965. Copies to DDC users only.*

Descriptors: (*Electromagnetic waves, Scattering), (*Drops, Water), (*Water, Carbon), Spheres, Refractive index, Clouds, Optical properties, Light, Infrared radiation, Combustion products, Particle size

Based on the theory by Aden and Kerker, computations of the scattering and absorption properties for concentric spherical water and soot particles have been performed for visible and infrared wavelengths. The complex dielectric constant for the kernel was assumed to be frequency independent; for the water shell it was assumed to be constant over the visible range only. Computations were performed for size parameter values up to 250. Results indicate that, for compound particles with a nucleus smaller than about one-tenth of the total diameter of the particle, the optical properties are almost completely determined by the outer shell. (Author)

**AD-624 999 Fld. 20/6**
*NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF*
**USE OF AN EVAPORATED DIELECTRIC FILM FOR DETERMINING THE OPTICAL CONSTANTS OF A METAL. I AND II.**
Research rept.,
by Jean M. Bennett, E. J. Ashley, H. E. Bennettand , and D. K. Burge. 31 Mar 65, 13p. Rept. no. nots-TP-3989
Task R360-FR-106/216-1/R011-01-01
NAVWEPS 9010
Unclassified report

*Availability: Published in Applied Optics v4 n8 p961-9 Aug 1965. Copies to DDC users only.*

Descriptors: (*Optical properties, Aluminum), (*Dielectric films, Lead compounds), Vapor plating, Fluorides, Metals, Substrates, Metals, Reflectivity, Refractive index

The method for determining the optical constants of an absorbing material by overcoating the material with a dielectric film and measuring the magnitude and wavelength at which the reflectance extrema occur has been critically examined both theoretically and experimentally. An experimental investigation was made for the case of lead fluoride on aluminum. It was found that the method does not work in the ultraviolet and visible regions of the spectrum because of the extreme sensitivity of the reflectance to scattering in the lead fluoride film. In the infrared, the method does not give accurate unique values for the optical constants of aluminum. In the theoretical investigation of the method, the assumption that the phase change on reflection is exactly 0 or pi at a minimum or maximum, respectively, has been shown to be in error. It is shown that, even if the method is modified so that this assumption is not made, accurate values for high reflectance materials cannot be obtained due to the insensitivity of the wavelengths of the extrema to the optical constants of the substrate. (Author)

**AD-625 009 Fld. 20/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**TRANSDUCER OF SPECTROMETER OF ELECTRONIC PARAMAGNETIC RESONANCE,**
by Ya. S. Lebedev, and O. M. Taranukha. 9 Dec 65, 6p. Rept. no. ftd-TT-65-1171
TT 65-64833
Unclassified report

Unedited rough draft trans. of Patent (USSR) 168 347, pub. 18 Mar 64, appl. no. 888522/26-25.

Descriptors: (*Transducers, Patents), (*Spectrum analyzers, Transducers), Paramagnetic resonance, Ultrahigh frequency, USSR

The object of the invention is a transducer of a spectrometer of electronic paramagnetic resonance consisting of a volumetric resonator and an ampoule with the specimen inside of it. For the purpose of locating the field of UHF at the position of the specimen on the ampoule there is placed a spiral of conductive material. (Author)

**AD-625 038 Fld. 20/6, 20/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**COHERENCE PROPERTIES OF ELECTROMAGNETIC RADIATION,**
by Wang Chih-Chiang. 30 Nov 65, 39p. Rept. no. ftd-TT-64-708
TT 65-64834
Unclassified report

Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v19 n5 p320-35 1963.

Descriptors: (*Electromagnetic waves, Interference), Light, Intensity, Photons, Quantum mechanics, Optics, Lasers, Interferometers, China

Recent advances are surveyed in research on the coherence properties of light and the concept is discussed of the photon degeneracy and the degree of coherence, which plays an important role in explaining many problems such as interference, beats, intensity fluctuations and so on. Since the processes of radiation occur at random the intensity of beat signal is determined by the correlation of the processes. Since photons are regarded as bosons there will be a corresponding term in the intensity fluctuations. From the experimental results available it appears that all coherent properties of light can be explained in terms of the basic concept of quantum mechanics. (Author)

**AD-625 115 Fld. 20/6, 9/2, 20/8**
**CFSTI Prices: HC $4.00 MF $0.75**
*RADIATION RESEARCH ASSOCIATES INC FORT WORTH TEX*
**MONTE CARLO CODES FOR STUDY OF LIGHT TRANSPORT IN THE ATMOSPHERE. VOLUME I: DESCRIPTION OF CODES.**
Final rept. 1 Jul 64-31 Jul 65,
by David G. Collins, and Michael B. Wells. Aug 65, 102p. Rept. no. rra-T54-1
Contract DA-28-043-AMC-00240 (E) Proj. DA-1V0-14501-B-53A-13-03 Task DASA-1304-01/12/017
ECOM 00240-F-Vol-1
Unclassified report

Descriptors: (*Monte Carlo method, Light transmission), (*Programming (Computers), Monte Carlo method), (*Light transmission, Atmosphere), Transport properties, Integral equations, Scattering

Monte Carlo procedures designated as LITE-I and LITE-II were developed to study the transport of light through the earth's atmosphere under various environmental conditions. LITE-I treats monochromatic light emitted from a point source, and LITE-II treats monochromatic plane sources of light. The codes have been written in both ALGOL for the Burroughs B-5000 and FORTRAN II for other computers. The codes are sufficiently flexible to treat multiple scattering in an atmosphere in which air density and aerosol size distribution vary independently and arbitrarily with altitude. Provision for treating ground and cloud reflection with an albedo method is also available in the codes. The codes have been verified through comparisons with other calculations of light transport in the atmosphere. Utilization instructions, input data formats, sample problems, and the ALGOL listings of the codes are given to aid those who wish to utilize the codes. (Author)

**AD-625 116 Fld. 20/6, 9/2, 4/1**
**CFSTI Prices: HC $5.00 MF $1.00**
*RADIATION RESEARCH ASSOCIATES INC FORT WORTH TEX*
**MONTE CARLO CODES FOR STUDY OF LIGHT TRANSPORT IN THE ATMOSPHERE. VOLUME II: UTILIZATION INSTRUCTIONS.**
Final rept. 1 Jul 64-31 Jul 65,
by David G. Collins, and Michael B. Wells. Aug 65, 192p. Rept. no. rra-T54-2
Contract DA-28-043-AMC-00240 (E) Proj. DA-1VO-14501-B-53A-13-03 Task DASA-1304-01/12.017
ECOM 00240-F-Vol-2
Unclassified report

Descriptors: (*Monte Carlo method, Programming (Computers)), (*Programming (Computers), Monte Carlo method), (*Light transmission, Atmosphere), Optics, Data processing systems, Programming languages, Control sequences

Monte Carlo procedures designated as LITE-I and LITE-II were developed to study the transport of light through the earth's atmosphere under various environmental conditions. LITE-I treats monochromatic light emitted from a point source, and LITE-II treats monochromatic plane sources of light. The codes have been written in both ALGOL for the Burrough's B-5000 and FORTRAN II for other computers. The codes are sufficiently flexible to treat multiple scattering in an atmosphere in which air density and aerosol size distribution vary independently and arbitrarily with altitude. Provision for treating ground and cloud reflection with an albedo method is also available in the codes. The codes have been verified through comparisons with other calculations of light transport in the atmosphere. Utilization instructions, input data formats, sample problems, and the ALGOL listings of the codes are given to aid those who wish to utilize the codes. (Author)

**AD-625 124 Fld. 20/6, 4/1, 3/2**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB*
**ABSOLUTE INTENSITY MEASUREMENTS IN THE EXTREME ULTRAVIOLET SPECTRUM OF SOLAR RADIATION.**
Environmental research papers,
by H. E. Hinteregger. 15 Jan 65, 47p. Rept. no. erp-147
Proj. AF-6688 Task 668806
AFCRL 65-746
Unclassified report

*Availability: Published in Space Science Reviews v4 p461-97 1965. Copies to DDC users only.*

Descriptors: (*Solar radiation, Ultraviolet spectroscopy), (*Ultraviolet spectroscopy, Solar radiation), Astrophysics, Optical instruments, Ultraviolet spectrophotometers, X-ray spectroscopy

Experimental results and problems of absolute intensity measurements of solar electromagnetic radiation in the extreme ultraviolet (EUV) and soft X-ray region of the spectrum (designated cumulatively as 'XUV' for brevity) are reviewed. The numerous practical problems are divided in two major areas, (a) general problems of heterochromatic absolute XUV spectrophotometry in the laboratory and (b) specific problems characteristic of requirements of solar physics, the physics of planetary atmospheres, and existing restrictions of space technology. Within the first area (a) emphasis is placed on recent progress toward justified reliance on ionization detectors without necessary connection to source standards. For the second area (b), emphasis is placed on the immediate need to have existing exploratory observations followed by a new phase of more systematic experiments of increased accuracy. (Author)

**AD-625 311 Fld. 20/6, 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ON THE THEORY OF THE CONVERSION OF THE FREQUENCY OF LIGHT WAVES BY A CRYSTAL,**
by B. V. Bokut, and A. G. Khatkevich. 8 Dec 65, 11p. Rept. no. ftd-TT-65-1078
TT 66-60083
Unclassified report

Unedited rough draft trans. of Akademiya Navuk BSSR, Minsk. Doklady, v8 n11 p713-6 1964.

Descriptors: (*Crystals, Light transmission), (*Frequency converters, Crystals), (*Light transmission, Crystals), Optics, Light, Polarization, USSR

This work examines all possible polarization waves occurring in a crystal when it is impinged by two light waves of different frequencies, and the electromagnetic heterogeneous harmonic waves generated by them.

**AD-625 337 Fld. 20/6, 3/2, 7/4**
**CFSTI Prices: HC $5.00 MF $1.00**
*COLORADO UNIV BOULDER LAB FOR ATMOSPHERIC AND SPACE PHYSICS*
**THE DESIGN AND DEVELOPMENT OF A HIGH RESOLUTION ECHELLE VACUUM SPECTROGRAPH AND ITS APPLICATION TO THE MEASUREMENT OF THE MOLECULAR CONSTANTS OF THE 1ξ (+) STATE OF NO (+).**
Scientific rept. no. 1, Feb 62-Aug 65,
by William Robert Simmons. Aug 65, 157p.
Contract AF19 (628)-4961 Proj. AF-8627 Task 862703
AFCRL 6670
Unclassified report

Continuation of Contract AF19 (628)-287.

Descriptors: (*Spectrum analyzers, Molecular spectroscopy), (*Ultraviolet spectroscopy, Nitrogen compounds), (*Nitrogen compounds, Oxides), Diffraction gratings, Vacuum, Resolution, Mirrors, Optical properties, Sounding rockets, Solar spectrum, Ions, Molecular properties, Molecular rotation, Molecular energy levels

The performance is evaluated of an echelle spectrograph in the Schumann region of the vacuum ultraviolet. A new vacuum spectrograph (primarily intended for rocket use) was designed and built in which off axis parabolic mirrors are incorporated to insure aberration free images at the optic axis. A comparison of parabolic and spherical mirrors is made and a new method of alignment of parabolic mirrors is given. All theory necessary for the design is derived from Rowland's original treatment of the plane grating. In order to demonstrate the capabilities of the echelle spectrograph, echellegrams of NO, NO (+), and H2 were made. Its dispersive properties and accuracy of wavelength identification is demonstrated by the identification of 123 rotational lines of the (0, 3) and (0, 4) bands of NO (+), thirty-six of which are new. The molecular constants were determined for the 1ξ (+) of NO (+). Instrumental resolving power is determined by the instrument slit width.

**AD-624 882 See Fld. 3/2**

**AD-624 895 See Fld. 3/2**

**AD-624 925 See Fld. 20/5**

**AD-624 935 See Fld. 20/5**

**AD-624 948 See Fld. 4/2**

**AD-625 128 See Fld. 20/14**

**AD-625 131 See Fld. 3/2**

**AD-625 134 See Fld. 3/2**

**AD-625 153 See Fld. 20/12**

**AD-625 233 See Fld. 4/1**

**AD-625 382 See Fld. 17/2**

**AD-625 562 See Fld. 20/10**

**AD-625 595 See Fld. 7/4**

**AD-625 604 See Fld. 7/4**

## 20/8. PARTICLE PHYSICS

**AD-624 950 Fld. 20/8, 12/1**
*ARMY ELECTRONICS LABS FORT MONMOUTH NJ*
**MODIFIED ISOBAR APPROXIMATION FOR PI-RHO SCATTERING,**
by Wayne J. Holman,III.. 28 Dec 64, 18p.
Unclassified report

*Availability: Published in The Physical Review, v138 n5B pB1286-1303 Jun 7 1965. Copies to DDC users only.*

Descriptors: (*Meson scattering, Nuclear isobars), (*Approximation (Mathematics), Meson scattering), Pions, Resonance scattering, Integral equations

The equations for the scattering amplitude for three pions in a J = 1 (-), T =0 state, subject to the approximation of elastic unitarity, are formulated in accordance with the N/D method. It is assumed that the incoming and outgoing pions resonate in pairs. A new method of approximation is introduced for the integration over the invariant mass of the intesmediate resonance in the unitarity condition: Phase-volume factors as well as the resonance denominators are used to define the mass of the intermediate resonance, which then becomes a function of the total channel energy. Upon writing the coupled integral equations for the N/D representation of the amplitude, using as input functions for N the proximate singularities of the pi, omega, and rho exchange graphs, we find that the branch points for these singularities are functions of the total channel energy. That is, the unphysical singularities become movable. When D is evaluated numerically and the omega resonance is located as a zero of its real part, determined by the requirement of the consistency of M and gamma with the values used in the input function, it is found that the repulsive pion-exchange term dominates the integral, and hence it is not possible to obtain a self-consistent omega resonance. The recoupling terms are considered only qualitatively, and methods of approximation are suggested for them. The physical consequences of the movable cuts are discussed in detail. (Author)

**AD-624 980 Fld. 20/8**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF*
**FE54 (N,P), (N, ALPHA), AND (N,2N) CROSS SECTIONS,**
by S. R. Salisbury, and R. A. Chalmers. 14 Jun 65, 6p.

Unclassified report

*Availability: Published in The Physical Review v140 n2B pB305-10 Oct 25 1965. Copies to DDC users only.*

Descriptors: (*Neutron capture, Iron), (*Decay schemes, Iron), (*Iron, Neutron cross sections), Nuclear reactions, Probability, Proton scattering, Alpha decay, Neutron scattering, Integrators, Neutron flux, Chromium, Manganese

Absolute cross sections for the Fe54 (n,p)Mn54, and Fe54 (n,alpha)Cr51 reactions have been measured for the neutron energy intervals 2.2 to 6.2 MeV and 13.1 to 16.8 MeV. The cross section for the Fe54 (n,2n)Fe53 reaction has been measured at 14.0 and 16.8 MeV. Ten samples 1 by 2 by 0.45 cm enriched to 97% in Fe54 were irradiated. Neutrons were produced with the D (d,n) and T (d,n) reactions, using gas targets and a Van de Graaff accelerator. Samples were placed 9 cm from the gas cell at angles from 0 to 122 degrees. The absolute neutron flux at 11 degrees was measured with a proton-recoil telescope. Relative neutron angular distributions were obtained from published D (d,n) and T (d,n) cross sections by integrating over source and target dimensions; the effect of scattering in the gascell window foil was also included. These angular distributions were normalized to the telescope values. The induced gamma activity following the decay of Mn54, Cr51, and Fe53 was counted with a large calibrated NaI scintillation spectrometer. The (n,p), (n,alpha), and (n,2n) results at 14 MeV agree with previous experimental work. Previous measurements of the (n,p) cross section from 2 to 6 MeV give values somewhat lower than the present work. All experimental results are somewhat higher than cross sections obtained by a statistical-model calculation based on optical-model potentials, while a more empirical calculation gives good agreement with the (n,2n) data. (Author)

**AD-625 138 Fld. 20/8, 7/4**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB*
**ELECTRON CAPTURE FROM ATOMIC NITROGEN AND OXYGEN BY PROTONS.**
Physical sciences research papers,
by R. A. Mapleton. 27 Jan 65, 22p. Rept. no. psrp-144
Proj. AF-8627 Task 862706
AFCRL 65-698

Unclassified report

*Availability: Published in Proceedings of the Physical Society v85 p1109-20 1965. Copies to DDC users only.*

Descriptors: (*Electron capture, Protons), Nitrogen, Oxygen, Atoms, Atomic orbitals, Atomic properties, Probability

In a previous paper by the author OBK cross sections were defined and calculated for H (+) + A (2s ;1L) to H (1s, 2s) + A (+) (2s'+1L') using the atomic orbitals calculated by Tubis. In the present paper the atomic orbitals of Roothaan and Kelly are used in a more extensive calculation of OBK cross sections for impact energies from 15 kev to 10 MeV. The cross sections are evaluated for the following cases: A = O (3P;2p4): A (+) = O (+) (4S, 2D, 2P;2p3), A (+) = O (+) (4P,2P;2s2p4): A = N (4S;2p3): A (+) = N (+) (3P;2p2), A (+) = N (+) (5S, 3S; 2s2p3). In the cases of p-orbital capture, the new cross sections are less than the former values from 100 kev to 900 kev, and larger elsewhere. A comparison of the cross sections for 2p- and 2s-orbital capture shows that 2s capture is dominant for impact energies in excess of several MeV, and that 2s capture is not negligible at all lower impact energies. The definition of the OBK cross section is extended to include electron capture between single charged, many-electron ions and atoms. The Born prior and post cross sections are evaluated using Tubis orbitals for capture into H (1s) for A = O (3P; 2p4). A (+) = O (+) (4S; 2p3). (Author)

**AD-625 210 Fld. 20/8**
**CFSTI Prices: HC $4.00 MF $0.75**
*ILLINOIS UNIV URBANA DEPT OF PHYSICS*
**RESEARCH IN NUCLEAR PHYSICS.**
Annual summary rept. for year ending 1 Dec 65,
by G. M. Almy. 1 Dec 65, 107p. Contract Nonr-1834 (05)

Unclassified report

Descriptors: (*Nuclear physics, Reports), K mesons, Meson scattering, Nuclear resonance, Pions, Integral equations, Deuterons, Mossbauer effect, Iron, Crystal lattice defects, Halogens, Electron capture, Gamma-neutron reactions, Neutron spectra, Bismuth

Contents: Polarization in the Elastic Scattering of Protons From Carbon and Nitrogen; Scattering of LowEnergy K (-)-Mesons by Nuclei; Peripheral Production and Decay: Correlations of Resonances; Peripheral Production and Decay of Resonances in High-Energy Meson-Nucleon Collisions; Evidence for Triangle Singularities; Interpretation of the k in K (+)p to K pion-pion-pion p; Integral Equation for the Anomalous Deuteron Vertex and a Comparison of two Normalization conditions; Bound States in a System of two Vector Mesons; Recoilless Fractions from Mossbauer Scattering; Mossbauer Effect at High Pressure for Fe57 in Titanium, Vanadium, and Copper; Outer-Shell Overlap Integrals as a Function of Distance for HalogenHalogen, Halogen-Alkali, and Alkali-Alkali Ions in the Alkali Halide Lattices; Mossbauer Evidence for Highly Charged States following Co57 Electron Capture in Hydrated Cobalt Compounds; Mossbauer Effect of FE57 on the Surface of Tungsten; Mossbauer Scattering Studies with Os186, Os188, Eu153 and Pr141; Cross Sections for the S32 (gamma, np) P30, Ca40 (gamma, np)K38g, and Zn66 (gamma, np)Cu64 Reactions from 50 to 300 MeV; Cross Sections for 016 (gamma, pion :)N16; Cross Sections for V51 (gamma, pion (-)2n)Cr49; Neutron Spectra from Monoenergetic Photons on Bismuth; Reaction He3 (gamma, pion +) H3 up to 260 MeV.

**AD-625 313 Fld. 20/8, 4/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*PITTSBURGH UNIV PA DEPT OF PHYSICS*
**ELECTRONIC AND IONIC COLLISION PROCESSES.**
Status rept. no. 19, 1 Sep-30 Nov 65,
by Manfred A. Biondi. 30 Nov 65, 3p. Contract Nonr-624 (00)

Unclassified report

See also AD-621 158.

Descriptors: (*Electron capture, Ions), (*Recombination reactions, Dissociation), Night sky, Neon, Argon, Cesium

A brief summary is given of work done on electron-ion recombination in night flow.

**AD-625 358 Fld. 20/8**
*CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS*
**A MODEL REQUIRING LIE GROUP SYMMETRIES,**
by J. C. Polkinghorne. 11 Mar 65, 8p. Contract AF-EOAR-63-79 AFOSR 65-2183

Unclassified report

*Availability: Published in Annals of Physics v34 n1 p153-60 Aug 1965. Copies to DDC users only.*

Descriptors: (*Nuclear models, Groups (Mathematics)), (*Elementary particles, Perturbation theory), Mesons, Nuclear spins, Nuclear scattering, Field theory

Cutkosky's model of vector mesons in mutual interaction is rediscussed and extended by the introduction of further particles. The dynamical picture used is one based on the generation of Regge poles in scattering amplitudes in perturbation theory. It is found that particles of spin less than one must belong to representations of the Lie group of which the vector mesons form the adjoint representation. It is also found that the strength of the interaction of the lower spin particles is determined by the strength of the mutual interaction of the vector mesons, at least in the approximation discussed. (Author)

**AD-625 398 Fld. 20/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**COUPLING BETWEEN THE ENERGY GAP AND SINGLE PARTICLE ENERGY FOR NUCLEAR MATTER,**
by Donald H. Kobe. 15 Feb 65, 23p. Rept. no. scientific-38
Contract AF61 (052)-701 Proj. AF-7112 Task 61445014
ARL 65-257

Unclassified report

Descriptors: (*Nuclear energy levels, Integral equations), Perturbation theory, Quantum mechanics, Elementary particles, Potential theory

The principle of compensation of dangerous diagrams is applied to second order which, when combined with the quasi particle self-energy to second order, gives a set of two nonlinear integral equations coupling the energy gap and the single particle energy. These equations are solved for a singlet state shell type interaction. Some remarks are made about their application to nuclear matter. (Author)

**AD-625 463 Fld. 20/8, 18/4**
**CFSTI Prices: HC $5.00 MF $1.00**
*ILLINOIS UNIV URBANA DEPT OF PHYSICS*
**NEUTRON SPECTRA FROM MONOENERGETIC PHOTONS OF BISMUTH.**
Doctoral thesis,
by Franca Tagliabue Kuchnir. Dec 65, 162p.
Contract Nonr-1834 (05)
Unclassified report

Descriptors: (*Neutron spectrum, Bismuth), (*Gamma-neutron reactions, Neutron spectrum), (*Bismuth, Neutron spectrum), Photons, Nuclear resonance, Gamma-ray scattering, Neutron detectors, Bremsstrahlung, Fast neutrons, Neutron detectors, Time-to-pulse-height converters

The technique for obtaining monochromatic photons from the 25 MeV betatron of the University of Illinois was extended to permit the measurement of neutron spectra from (gamma, n) reactions over the giant resonance region. Previous experiments with the bremsstrahlung monochromator involved the study of elastic and quasielastic scattering of gamma-rays. Neutron detection entailed new techniques, such as the discrimination against the high gamma-ray background, the development of a time-of-flight measuring apparatus, and a method for data analysis. The new technique used in this experiment presents the advantage that both the photon and neutron energies are known, and furthermore that the photon energy can be varied continuously. The experimental results were found to be in agreement with available theoretical calculations based on the particlehole model. Schematically this model was proposed to show how the residual particle-hole interaction could combine single particle excitations, arising in the absorption of a dipole gamma-ray, so as to produce a coherent giant dipole state.

**AD-625 500 Fld. 20/8, 7/4**
**CFSTI Prices: HC $4.00 MF $1.00**
*FREIE UNIVERSITAET BERLIN (WEST GERMANY) INSTITUT FUER THEORETISCHE PHYSIK*
**INTERACTION OF THREE HYDROGEN ATOMS.**
Final technical rept.,
by R. G. Wrzesinsky. 1 Feb 65, 131p. Contract AF-EOAR-61-22 AFOSR 65-1684
Unclassified report

Descriptors: (*Hydrogen, Atomic properties), Atomic energy levels, Eigenfunctions, Nuclei, Valence, Reaction kinetics, Atoms, Molecules

By using the valence bond method, the two lowest energy terms and the corresponding eigenfunctions of the system of three hydrogen atoms are calculated. The intention is to give a general survey about the global structure of the energy surfaces using a simple calculating procedure, rather than to calculate the terms with great accuracy confined to a few simple constellations. The coupling coefficients are calculated for the nonadiabatic motion of the nuclei confining the nuclei forming an equilateral triangle to the neighborhood of the constellation. For an investigation of the nonadiabatic H2-H scattering problem this constellation might be of particular interest because the energy surfaces are degenerated in the equilateral triangle giving a strong contribution to the coupling effect.

**AD-625 519 Fld. 20/8**
**CFSTI Prices: HC $4.00 MF $1.00**
*NAVAL ORDNANCE LAB CORONA CALIF*
**THE ELASTIC SCATTERING OF LOW ENERGY ELECTRONS FROM ATOMIC HELIUM.**
Doctoral thesis,
by Raymond W. LaBahn. 24 Nov 65, 140p.
Task R360-FR-104/211-1/R011-01-01
NAVWEPS 8824
Unclassified report

Descriptors: (*Elastic scattering, Electrons), (*Helium, Elastic scattering), Atoms, Perturbation theory, Potential theory, Phase shift, Quantum mechanics, Atomic orbitals, Approximation (Mathematics), Iterative methods, Wave functions

Elastic electron scattering from atomic helium is examined within the framework of perturbed HartreeFock theory for the energy region from 0 to 50 eV. Interaction potentials are derived to describe the distortion induced into the target atom by the incident electron in the adiabatic approximation. Dynamical corrections to the adiabatic approximation are also examined and these incorporated into the formalism through a 'velocitydependent' potential. The s-, p-, and d-wave scattering phase shifts were computed by numerical iteration of the resulting equations. These phase shifts are then used to compute the elastic scattering cross sections and the results compared with other recent theoretical predictions and experimental data. (Author)

**AD-625 548 Fld. 20/8, 20/3**
*MINNESOTA UNIV MINNEAPOLIS DIV OF PHYSICAL CHEMISTRY*
**NUCLEAR MAGNETISM,**
by John E. Wertz. 1963, 14p. Contract AF-AFOSR-200 63 AFOSR 65-1761
Unclassified report

*Availability: Published in Magnetic Materials Digest, Chapter 18 p241-54 n.d. Copies to DDC users only.*

Descriptors: (*Nuclear properties, Magnetism), Nuclear reactions, Magnetic properties, Nuclear magnetic moments, Nuclear spins, Specific heat, Hyperfine structure, Nuclear magnetic resonance

There is intense activity apparent in a wide range of effects of interactions of nuclei with non-zero spin on magnetic systems. Direct hyperfine interactions, indirect and direct nuclear spin-spin interactions (including possible nuclear ferromagnetism), exchange interactions, relaxation processes, phonon interactions, domain wall interactions with magnetic fields, separations of contributions by sublattices, interactions of nuclear quadrupole moments with electric field gradients and interpretations in terms of ordering--all these suggest that this limited fraction of the whole study of magnetism may contribute a measure of understanding far out of proportion to the fractional number of papers in this area.

**AD-625 559 Fld. 20/8, 20/3**
*BOSTON UNIV MASS DEPT OF PHYSICS*
**A NOTE ON FIELD THEORIES WITHOUT MASS RENORMALIZATION,**
by W. S. Hellman, and P. Roman. 13 Mar 65, 4p.
Contract AF-AFOSR-385-63 AFOSR 65-1813
Unclassified report

*Availability: Published in Il Nuovo Cimento (Italy) v37 (s10) p779-81 16 May 1965. Copies to DDC users only.*

Descriptors: (*Field theory, Bosons), (*Bosons, Field theory), S-matrix, Mass-energy relation, Quantum mechanics, Functional analysis

**AD-625 561 Fld. 20/8**
*BOSTON UNIV MASS DEPT OF PHYSICS*
**MASS FORMULA IN THE COVARIANT SPIN-UNITARY SPIN SCHEME,**
by P. Roman, and J. J. Aghassi. 30 Jan 65, 4p.
Contract AF-AFOSR-385-63 AFOSR 65-1814
Unclassified report

*Availability: Published in Il Nuovo Cimento (Italy) v36 (s10) p1062-5 1 Apr 1965. Copies to DDC users only.*

Descriptors: (*Elementary particles, Mass number), (*Mass number, Elementary particles), Bosons, Baryons, Mesons, Pions, K mesons, Hyperons, Nuclear spins, Field theory

A rigorous justification is given of a mass formula for baryons and bosons.

**AD-625 563 Fld. 20/8**
*BRANDEIS UNIV WALTHAM MASS DEPT OF PHYSICS*
**SPONTANEOUS SYMMETRY BREAKDOWN AND THE MU-E-GAMMA INTERACTION,**
by S. Deser, and R. Arnowitt. 28 Dec 64, 12p.
Contract AF-AFOSR-368-63 AFOSR 65-1787
Unclassified report

Prepared in cooperation with Northeastern Univ., Boston, Mass. Dept. of Physics.

*Availability: Published in the Physical Review v138 n3B pB712-23 10 May 1965. Copies to DDC users only.*

Descriptors: (*Meson reactions, Electrons), (*Gamma emission, Field theory), Muons, Electromagnetic fields, Nuclear resonance, Invariance, Green's function, Approximation (Mathematics)

Spontaneous breakdowns of symmetries have been examined for a system of two charged fields of zero bare mass (the 'muon' and 'electron' fields) interacting minimally with the electromagnetic field. Upon arranging the two fields into an 'isotopic' doublet, the Lagrangian is seen to possess SU (2) symmetry. Three possibilities are available: (a) no spontaneous breakdown of the SU (2) symmetry is allowed and the muon-electron system remains a degenerate doublet; (b) a partial breakdown occurs in which a mass splitting develops but the heavier muon remains stable; (c) a complete breakdown occurs in which the muon decays into an electron plus a photon. Using the high-energy scheme of Baker, Johnson, and Willey, approximate solutions for the one-fermion Green's function and vertex function are examined. (The approximation scheme has the advantage that no ad hoc cutoffs need be invoked). The solutions obtained permit case (b) to occur but not case (c), provided improper Lorentz invariance is imposed. It is shown, at least for the one-fermion Green's function, that no solutions breaking P, C, or T invariance can arise. (Author)

**AD-625 564 Fld. 20/8**
*FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)*
**ENERGY ESTIMATION FOR HIGH-ENERGY NUCLEAR INTERACTIONS,**
by L. S. Peak, and R. L. S. Woolcott. 16 Mar 64, 10p. Contract AF-AFOSR-305-63 AFOSR 65-1811
Unclassified report

*Availability: Published in Il Nuovo Cimento (Italy) v34 (s10) p1-10 1 Oct 64. Copies to DDC users only.*

Descriptors: (*Nuclear reactions, Nuclear energy), Nuclear models, Nucleons, Meson scattering, Proton reactions

The inaccuracies of the various energy estimators for high-energy nuclear collisions are discussed. A new method of estimation based on a two-centre model is proposed, involving measurement of the quatrile angle, a, and catering for multiple collisions. With this model Ta (where T is the energy of the created particles) is shown to be dependent upon the fireball multiplicity and values of Ta are shown to be consistent with the model and a nucleon-nucleon charged multiplicity of approximately 10. The method is shown to estimate primary energies more in accordance with the cosmic-ray energy spectrum than the Castagnoli method and is further verified by comparison with machine energies. (Author)

**AD-625 569 Fld. 20/8, 20/10**
*MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY*

**PROOF THAT SCATTERING IMPLIES PRODUCTION IN QUANTUM FIELD THEORY,**
by Stanley O. Aks. 11 Sep 64, 17p. Contract AF-AFOSR-500-64 AFOSR 65-1817
Unclassified report

*Availability: Published in Journal of Mathematical Physics v6 n4 p516-32 Apr 1965. Copies to DDC users only.*

Descriptors: (*Field theory, Quantum mechanics), (*Nuclear scattering, Elementary particles), Production, S-matrix, Elastic scattering, Relativity theory

A proof of the necessity of production processes in quantum field theory is carried out in the axiomatic framework. It is shown that a field theory that is assumed to have a nontrivial scattering amplitude violates crossing symmetry, if production processes are absent. The proof is based on the rigorous analytic properties of the scattering amplitude, particularly the analyticity in the invariant-scattering variables s, t, and u. In the case of a scalar theory with pairing symmetry, the scattering amplitude is known to be analytic within the domain absolute value (stu) < 7168m to the 6th, except for the usual cuts. Under the working assumption that production processes are null, it is shown that this domain can be enlarged by applying the elastic unitarity conditions beyond the the (usual) elastic region. The domain is enlarged sufficiently to include the first Landau singularity of the absorptive part of the scattering amplitude. This singularity is not symmetric in s and t within the extended domain, and this is incompatible with the crossing symmetry of the scattering amplitude. In order to avoid a contradiction, the discontinuity across this Landau singularity must be null. It follows that the scattering amplitude must itself be null. In the course of the proof it is shown that the conclusion is valid for a scattering amplitude satisfying the requirements of an S-matrix theory embodied in the Mandelstam representation. (Author)

**AD-625 573 Fld. 20/8, 20/10**
*CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS*
**COMMENTS ON RELATIVISTIC SUPERMULTIPLET THEORIES,**
by Steven Weinberg. 22 Mar 65, 5p. Contract AF-AFOSR-232-64 AFOSR 65-1815
Unclassified report

*Availability: Published in The Physical Review v139 n3B pB597-B601 9 Aug 1965. Copies to DDC users only.*

Descriptors: (*Nuclear energy levels, Relativity theory), (*Field theory, Operators (Mathematics)), Nuclear spins, Elementary particles, Invariance, Nuclear structure, Wave functions

It is proved that no well-behaved group of unitary operators on physical Hilbert space can have irreducible representations containing all spin states of the particles involved. It is shown that the recently proposed U (12) symmetry evades this theorem by acting on the 'generalized M function,' rather than on the physical Hilbert space. Some other possible evasions are also discussed. (Author)

**AD-625 596 Fld. 20/8, 12/1**
*CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS*
**SOLUTION OF A BETHE-SALPETER EQUAON,**
by Charles Schwartz. 24 Sep 64, 3p. Contract AF-AFOSR-130-63 AFOSR 65-2192
Unclassified report

*Availability: Published in The Physical Review v137 n3B pB717-9 Feb 8 1965. Copies to DDC users only.*

Descriptors: (*Equations of motion, Elementary particles), (*Calculus of variations, Equations of motion), Operators (Mathematics), Relativity theory, Quantum mechanics, Nuclear reactions, Nuclear energy levels

The Bethe-Salpeter equation arising from a phi-cubed theory is solved numerically for several energies (bound states only) and symmetry states. The method used is a variational calculation in the four-dimensional Euclidean space arrived at by the transformation due to Wick. A high degree of accuracy is achieved by using only a very small amount of common computing machine capabilities. (Author)

**AD-625 071** **See Fld. 9/5**

**AD-625 115** **See Fld. 20/6**

**AD-625 278** **See Fld. 20/10**

**AD-625 355** **See Fld. 12/1**

**AD-625 357** **See Fld. 20/10**

**AD-625 572** **See Fld. 20/10**

**AD-625 578** **See Fld. 20/12**

**AD-625 597** **See Fld. 20/10**

**AD-625 600** **See Fld. 4/1**

## 20/9. PLASMA PHYSICS

**AD-624 879 Fld. 20/9, 20/1**
*RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE*
**LONGITUDINAL WAVES IN A WEAKLY IONIZED GAS,**
by Uno Ingard, and Kenneth W. Gentle. 24 Mar 65, 2p. Contract DA-36-039-AMC-03200 (E), Nonr-1841 (42)
Unclassified report

*Availability: Published in The Physics of Fluids, v8 n7 Jul 1965. Copies to DDC users only.*

Descriptors: (*Plasma medium, Sound transmission), (*Sound, Propagation), Glow discharges, Partial differential equations, Turbulence, Frequency

**AD-624 927 Fld. 20/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*WESTINGHOUSE RESEARCH LABS PITTSBURGH PA*
**BASIC PLASMA PROCESSES.**
Final research rept., 16 Nov 64-15 Nov 65,
by A. V. Phelps, and C. L. Chen. 7 Dec 65, 33p.
Rept. no. rr-65-9E2-511-R1
Contract Nonr-4725 (00)
Unclassified report

Descriptors: (*Plasma physics, Cesium), (*Cesium, Plasma medium), Alkali metals, Vapors, Ionization, Helium, High-temperature research, Brazing, Hall effect, Light transmission, Reflection, Resonance, Transport properties, Controlled atmospheres

An experimental arrangement for the study of cesium seeded, helium gas plasmas at high temperatures is described. This system is to be used for the study of non-equilibrium ionization and Hall coefficients in these plasmas. A description is given of an experiment being constructed for the study of the reflection and transmission characteristics of cesium resonance radiation. The high temperature brazing technology of polycrystalline alumina (PCA) to metal, PCA to sapphire, and metal to metal has also been studied briefly and the results are presented. (Author)

**AD-624 998 Fld. 20/9, 20/3, 12/1**
*NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF*
**DIFFUSION AND CONDUCTIVITY OF PLASMAS IN STRONG EXTERNAL FIELDS,**
by H. S. Green, and R. B. Leipnik. Dec 65, 29p.
Rept. no. nots-TP-3978
NAVWEPS 9003
Unclassified report

*Availability: Published in International Journal of Engineering Science v3 p491-514 1965. Copies to DDC users only.*

Descriptors: (*Plasma medium, Diffusion), (*Electrical conductance, Plasma medium), Magnetic fields, Nbody problem, Transport properties, Charged particles, Friction, Tensor analysis, Differential equations, Integrals

The diffusion tensors of a plasma in strong external fields are derived from first principles. A pair of integro-differential equations, which are the first members of a chain analogous to Yvon's hierarchy, is obtained, together with the required boundary conditions and an approximation, called the disjunctive approximation, which makes the solution determinate. It is shown how the diffusion tensors can be calculated from the solution of these equations. A study is made of the influence of the external fields on the encounters between charged particles in a plasma. A generalization of Boltzmann's equation is obtained, which takes into account many-body interactions in the plasma and the effect of the external field on the collision integral. Explicit expressions are obtained for the friction tensors, the diffusion tensors, and the electrical conductivity tensor, for a plasma subject to a strong external magnetic field. (Author)

**AD-625 033 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS*
**NONLINEAR MECHANICS OF UNIVERSAL PLASMA INSTABILITIES.**
Technical note,
by Herbert Lashinsky. Aug 65, 20p. Rept. no. bn-411
Contract AF-AFOSR-141-65
Unclassified report

Presented at International Conference on Ionization Phenomena, Belgrade, Aug 22-27 1965.

Descriptors: (*Plasma oscillations, Nonlinear systems), (*Plasma physics, Stability), Fluid mechanics, Gas ionization, Dynamics

Certain nonlinear mode-competition phenomena observed in experiments on the universal plasma instability in a thermal plasma device (Q-machine) have been analyzed by extending the usual phase-plane methods of nonlinear mechanics, the phase-plane coordinates in this case being the mode energies. Ion Landau damping of the universal instability provides an experimental means for selective control of the mode amplitudes. The results of mode-competition experiments using this technique are in agreement with the theoretical analysis and the relevance of the results to similar phenomena in gas lasers and lumpedparameter vacuum-tube circuits is discussed. (Author)

**AD-625 043 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*CLARENDON LAB UNIV OF OXFORD (ENGLAND)*
**INVESTIGATION OF THE PROPERTIES OF HOT PLASMA GASES AND MEASUREMENT OF GAS TEMPERATURES NEAR SOLID SURFACES.**
Final scientific rept. 1961-1964,
by A. von Engel. 28 Jan 65, 14p. Contract AF61 (052)-495 AFML TR-65-419
Unclassified report

Descriptors: (*Plasma jets, Temperature), (*Flames, Electrons), Measurement, Calorimetry, Gases, Motion, Ionization, Density, Great Britain

Studies were made of the methods of gas temperature measurements particularly of a plasma jet where the temperature can be derived from the gas density. One density measurement uses in principle the determination of the range of alpha-particles from a polonium source. Two other methods, one using the Doppler effect of sound and the other using the velocity of a pressure pulse were also discussed. The calorelectric effect was investigated experimentally and theoretically. Its mechanism was suggested supported by measurements of the electron temperature. A study of the ionization in flames led to the conclusion that the electron temperature in flames at atmospheric pressure can exceed markedly that of the neutral gas. As a result of it the large electron concentration in flames may well be caused by electron collisions rather than by a series of processes termed chemi-ionization. The theory of double probes was extended to high gas pressures where the motion of charges is controlled by collision processes such as mobility and diffusion.

**AD-625 070 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF RETAINING AND ACCUMULATING HIGH TEMPERATURE PLASMA IN A TRAP,**
by S. P. Lomnev, E. B. Pereslavtsev, and V. M. Shatunov. 9 Dec 65, 6p. Rept. no. ftd-TT-65-1168
TT 65-64854
Unclassified report

Unedited rough draft trans. of Patent (USSR) 167 260, appl. no. 897246/26-25, 25 Apr 63.

Descriptors: (*Plasma medium, Collecting methods), Containers, Magnetic fields, Patents, USSR

The object of invention is a method of retaining and accumulating in a trap high temperature plasma formed by injected particles, for example deutons captured and held by a magnetic field. For the purpose of improving the conditions of the capture and increasing the concentration and particle heating it utilizes a dipole-type magnetic field increasing in time the rate and the magnitude of the growth of which is determined by the parameters of the concrete arrangement. (Author)

**AD-625 082 Fld. 20/9, 20/13**
**CFSTI Prices: HC $2.00 MF $0.50**
*SPERRY RAND RESEARCH CENTER SUDBURY MASS*
**ELECTRON THERMAL DIFFUSIVITY IN RARE-GAS AFTERGLOW PLASMAS,**
by Kaare J. Nygaard. Nov 65, 43p. Rept. no. srrc-RR-65-96 ,Scientific-3
Contract AF19(628)-4183 Proj. AF-4642 Task 464202
AFCRL 65-842
Unclassified report

Descriptors: (*Plasma medium, Thermal diffusion), (*Electrons, Thermal diffusion), (*Thermal diffusion, Plasma medium), Helium group gases, Heat transfer, Glow discharges, Transport properties, Plasma physics, Probes

This paper describes an experimental investigation of the electron thermal diffusivity D sub T in roomtemperature afterglow plasmas in neon and helium. The measurements were made in the absence of a magnetic field and covered an electron density range from 10 to the 9th power - 10 to the 12th power/cc. The principle of the experiment was to heat the electrons selectively by a short microwave pulse, and then observe electron temperature transients at different locations within the plasma. The electron temperatures were determined by taking advantage of the temperature sensitivity of the electroacoustic Tonks-Dattner resonances. For electron-ion collision frequencies much larger than the electron-neutral collision frequency, the experimental data for D sub T are inversely proportional to the electron density, and agree closely with the transport theory of Spitzer and Harm. In the limit of the weakly ionized plasma, the electron thermal diffusivity is independent of electron density, which is also in agreement with theory. (Author)

**AD-625 171 Fld. 20/9, 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB*
**HYDROMAGNETIC IONIZING WAVES.**
Physical sciences research papers,
by Allen G. Rubin, and Ram S. Kushwaha. Sep 65, 22p. Rept. no. psrp-146
Proj. AF-8608 Task 860801
AFCRL 65-706
Unclassified report

Descriptors: (*Magnetohydrodynamics, Gas ionization), (*Gas ionization, Magnetohydrodynamics), Shock waves, Gas flow, Electric fields, Magnetic fields, Electromagnetic waves, Ionization, Plasma physics

A theory of hydromagnetic ionizing waves has been developed which is valid in the region in which gas pressure is negligible, compared with magnetic pressure. The theory takes into account the energy expended in partial ionization of the gas behind the wave. The usual high conductivity boundary condition behind the wave is not employed. The electric field in front of the wave is taken as a parameter. Results of this theory are compared with available experimental measurements, and show good agreement. (Author)

**AD-625 189 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO*
**THE WAVE NATURE OF MOVING STRIATIONS,**
by D. A. Lee, A. Garscadden, and P. Bletzinger. Oct 65, 21p. Rept. no. arl-65-202
Proj. AF-7073
Unclassified report

Descriptors: (*Plasma medium, Electromagnetic waves), (*Glow discharges, Electromagnetic waves), Lowpressure research, Differential equations, Measurement, Electromagnetic pulses, Direct current, Frequency, Mercury, Argon, Gas ionization, Plasma oscillations

The results are presented of time and space resolved measurements on the response of the positive column of a low-pressure glow discharge to external perturbations. From these the profile, structure and the backward wave nature of moving striations are clearly indicated. A new method of solution to the equation originally presented by Pekarek (Proceedings of Sixth International Conference on Ionization Phenomena in Gases, v.2, p. 133) is shown to contain all of the experimental results including the dispersion of a pulse disturbance. A stability criterion is derived; especially useful is that the onset of striations in a discharge can be calculated from a quadratic equation. (Author)

**AD-625 239 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**NEW METHODS OF PLASMA DIAGNOSTICS ACCORDING TO SPECTROSCOPIC DATA,**
by A. P. Kudrin, and G. V. Sholin. 19 Nov 65, 17p. Rept. no. ftd-MT-65-99
TT 66-60045
Unclassified report

Edited machine trans. of Predstavlennyy na Mezhdunarodnyi Simpozium Po Ionzatsionnym Yavleniyam v Gazakh (no. 6) Paris, July 63, Doklady, 1963, p1-16.

Descriptors: (*Plasma medium, Spectroscopy), Electron density, Electron transitions, Stark effect, Hydrogen, Helium, Atoms, Charged particles, Ions, Quadrupole moments

**AD-625 268 Fld. 20/9, 20/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**LORENTZ INVARIANCE, MOMENTUM-ENERGY TENSORS, AND THE M H D PROBLEM,**
by Dominic G. B. Edelen. Nov 65, 46p. Rept. no. rm-4763-PR
Contract AF49(638)-700
Unclassified report

Descriptors: (*Hamiltonian, Invariance), (*Magnetohydrodynamics, Hamiltonian), Momentum, Energy, Tensor analysis, Equations of motion, Field theory

There has long been controversy as to the 'correct' form of the momentum-energy tensor and of the force law and/or the current vector in general formulations of magnetohydrodynamical problems. This memorandum attempts to clarify the various questions involved and presents two alternative methods of procedure whereby internally consistent, physically well-set formulations can be obtained. The major emphasis is on the Hamiltonian approach in terms of Lorentz invariance. The results should be of use in both theoretical and applied problems.

**AD-625 424 Fld. 20/9**
**CFSTI Prices: HC $3.00 MF $0.75**
*CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB*
**PLASMA RESEARCH.**
Quarterly progress rept. no. 2, 1 Apr-30 Jun 65. Jun 65, 65p. Contract AF33(615)-1078 Grant, AF-AFOSR-139-65
Unclassified report

Descriptors: (*Plasma physics, Scientific research), Reviews, Magnetic fields, Low-temperature research, High-temperature research, Programming (Computers), Mathematical models, Cyclotrons, Capacitors, Synchrotrons, Electromagnetic waves

This research in plasmas is part of an integrated program of research and teaching in the problems of creation, containment, heating, stability, radiation, and measurement of the physical and electromagnetic properties of high- and low-temperature plasmas. The basic high-temperature plasma research facility consists of a 250,000-joule capacitor energy-storage system and related electronic control and safety equipment. This bank operates two basic experiments each of which requires pulse magnetic fields in excess of 50,000 gauss.

**AD-625 429 Fld. 20/9, 20/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*YALE UNIV NEW HAVEN CONN*
**PROGRESS REPORT, JANUARY 1, 1966,**
by Henry Morgenau. 1 Jan 66, 14p. Contract NONR-609(51)
Unclassified report

Descriptors: (*Plasma physics, Theory), (*Electromagnetic fields, Plasma physics), Electron density, Distribution functions, Conductivity, Perturbation theory, Field theory

**AD-625 558 Fld. 20/9, 9/3**
**CFSTI Prices: HC $3.00 MF $0.50**
*AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO*
**REVIEW OF THEORETICAL ANALYSES OF ARC HEATING IN A TUBE,**

by James G. Skifstad. Oct 65, 52p. Rept. no. arl-65-207
Proj. 7063 Task 706303

Unclassified report

Descriptors: (*Electric arcs, Heating), (*Arc heaters, Plasma medium), Electric discharges, Laminar boundary layer, Gas flow, Transport properties, Momentum, Energy, Axially symmetric flow, Plasma oscillations

The analytical methods utilized to compute the mutual interaction between a d.c. arc and a gas flow passing concurrently through a duct are reviewed and critically discussed. The numerous approximate and exact solutions for the fully-developed flow are presented in tabular form for reference purposes. Recent methods for solving the inlet flow problem are discussed, including the use of approximate laminar boundary layer methods and the exact numerical method. A new approximate solution is presented for an arc whose boundary is a paraboloid of revolution: the energy equation then reduces to a hypergeometric form. Evidence is presented showing that the results of computations for d.c. arcs may be in reasonable agreement with experimental data, notably the integrated parameters such as arc voltage, the development length, etc. The existing methods for describing similar situations, but with a.c. arcs are also reviewed. It is pointed out that one might expect an oscillatory coupling between the flow and the power input at certain frequencies, resulting in resonances and possibly standing waves in the tube. Certain open problems concerned with the interaction of an arc and a coaxial gas flow are presented in conclusion. (Author)

**AD-625 580 Fld. 20/9, 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*GRADUATE AERONAUTICAL LABS CALIF INST OF TECH PASADENA*
**FINAL SUMMARY REPORT,**
by Hans W. Liepmann. Dec 65, 9p. Contract Nonr-220 (21)

Unclassified report

Descriptors: (*Plasma medium, Fluid mechanics), (*Superaerodynamics, Scientific research), Reviews

A summary is given of research in plasma fluid mechanics and rarefied gas flows.

**AD-625 591 Fld. 20/9, 7/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*RESEARCH INST TEMPLE UNIV PHILADELPHIA PA*
**PLASMA JET CHEMISTRY.**
Final rept.,
by C. S. Stokes, J. A. Cahill, J. J. Correa, and A. V. Grosse. Dec 64, 37p. Contract AF-AFOSR-62-196 Proj. AF-9750 Task 975001
AFOSR 65-1802

Unclassified report

Descriptors: (*Plasma jets, Synthesis (Chemistry)), (*Synthesis (Chemistry), Plasma jets), Helium group gases, Cathodes, Powders, Nitrogen, Tungsten, Anodes, Helium, Argon, Release mechanisms, Metals, Chemical compounds, Oxides, Reduction (Chemistry), Refractory metals, Nitrides, Carbides, Rings, Quenching (Cooling), High-temperature research

Three types of plasma jets are described: a noble gases plasma jet, a nitrogen plasma jet, and a plasma jet cathode as chemical feeder. Powder feeding devices and quenching devices are considered. The use of the plasma jet is described for several chemical reactions: metal oxides reduction, refractory metals nitrides formation, and refractory metals carbides formation. The temperatures attainable with plasma jets are in the range of 5000K to 50,000K. (Author)

**AD-624 903 See Fld. 4/1**

**AD-624 913 See Fld. 10/2**

**AD-625 133 See Fld. 20/14**

**AD-625 178 See Fld. 3/2**

**AD-625 457 See Fld. 8/14**

**AD-625 480 See Fld. 4/1**

**AD-625 575 See Fld. 10/2**

## 20/10. QUANTUM THEORY

**AD-624 865 Fld. 20/10, 12/1**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**TRANSFORMATION FROM A LINEAR MOMENTUM TO AN ANGULAR MOMENTUM BASIS FOR RELATIVISTIC PARTICLES OF NONZERO MASS AND ANY SPIN,**
by H. E. Moses. 14 Jan 65, 11p.

Unclassified report

*Availability: Published in Journal of Mathematical Physics v6 n8 p1244-54 Aug 1965. Copies to DDC users only.*

Descriptors: (*Momentum, Operators (Mathematics)), (*Relativity theory, Particles), Matrix algebra, Transformations (Mathematics), Groups (Mathematics), Spin

The infinitesimal generators of the inhomogeneous Lorentz group have been given in a basis in which the components of the linear-momentum operators are diagonal and in another basis in which the square of the angular momentum is diagonal for all unitary irreducible ray representations of the group. In a previous paper the two bases were shown to be related for representations corresponding to zero mass and any finite spin. In the present paper the two bases are shown to be related for representations corresponding to nonzero mass and any spin. Thus this paper and the preceding one allow expansion of relativistic plane waves into relativistic spherical waves and vice-versa for particles of any spin and any mass. The relation between the linear- and angularmomentum bases has been used to integrate the infinitesimal generators in the angular-momentum basis and thereby obtain closed expressions which show how the angular momentum of particles of zero mass and any finite spin transform under changes of frame of reference. Similar use could be made of the transformation of the present paper. Results of such use will be given in a later paper. (Author)

**AD-624 881 Fld. 20/10, 7/4**
*WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST*
**QUANTUM-MECHANICAL BOLTZMANN EQUATION,**
by David K. Hoffman, John J. Mueller, and C. F. Curtiss. 15 Jun 65, 7p. Contract NsG-275-62

Unclassified report

*Availability: Published in the Journal of Chemical Physics, v43 n8 p2878-84 Oct 15 1965. Copies to DDC users only.*

Descriptors: (*Quantum mechanics, Transport properties), (*N-body problem, Quantum mechanics), Distribution functions, Statistical mechanics, Integrals, Differential equations, Corrections

A Boltzmann equation is derived from the N-particle Schrodinger equation. The development is based on the solution of the two-particle quantum-mechanical Liouville equation due to Green. The various approximations involved in the derivation are discussed and the collision integral and corrections are compared to their classical analogs. Further development of the collision integral yields the standard result, the usual Boltzmann collision integral in which the classical differential cross section is replaced by its quantum-mechanical counterpart. (Author)

**AD-625 278 Fld. 20/10, 20/8**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**THE TAMM VARIATIONAL PRINCIPLE AND ITS GENERALIZATION TO THE SCATTERING AMPLITUDE.**
Revised ed.,
by B. L. Moiseiwitsch, and G. M. Stacey. 2 Apr 65, 8p. Contract N62558-4297

Unclassified report

Revision of manuscript received 19 Mar 65. Performed in cooperation with Queen's Univ., Belfast (Northern Ireland). Dept. of Applied Mathematics.

*Availability: Published in Proceedings of the Physical Society v86 p737-43 1965. Copies to DDC users only.*

Descriptors: (*Phase shift, Calculus of variations), (*Calculus of variations, Potential scattering), Elastic scattering, Electrons, Hydrogen, Wave functions, Integral equations

A variational principle for the phase shift which is analogous to that originated by Tamm is derived, and its connection with certain approximations for the phase shift is discussed. Further, the Tamm variational principle is used to establish an integral equation involving the Kato functional. The Tamm variation principle is then generalized to give a variational principle for the scattering amplitude. Finally, application is made to the scattering of electrons by the static field of a hydrogen atom. (Author)

**AD-625 357 Fld. 20/10, 20/8**
*CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS*
**THE PROBLEM OF CAUSALITY IN S-MATRIX THEORY,**
by R. J. Eden, and P. V. Landshoff. 15 Jun 64, 24p. Contract AF-EOAR-79-63 Proj. AF-9751 Task 975101
AFOSR 65-1782

Unclassified report

*Availability: Published in Annals of Physics v31 n2 Ptl p370-90 Feb 1965. Copies to DDC users only.*

Descriptors: (*S-matrix, Field theory), (*Field theory, S-matrix), Relativity theory, Scattering, Potential theory, Wave functions

The problem is considered of introducing space and time concepts into scattering theory with a view to stating a causality principle from which it may be possible to derive analytic properties of S-matrix elements. Problems are raised related to: partial localization of interactions in space so that noninteracting terms can be separated out; partial localization in time so that initial and final states can be separated and macroscopic time become meaningful; the use of negative energy states in superpositions to form wave packets; approximations to multiparticle S-matrix elements and their relevance to simple scattering processes; and limiting procedures that may relate experiments to the conventional S-matrix elements. (Author)

**AD-625 364 Fld. 20/10, 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**STUDIES IN PERTURBATION THEORY. XI. LOWER BOUNDS TO ENERGY EIGENVALUES, GROUND STATE AND EXCITED STATES,**
by Per-Olav Lowdin. 15 Jun 65, 47p. Rept. no. scientific-16
Contract AF61 (052)-701 ARL 65-248

Unclassified report

Descriptors: (*Perturbation theory, Atomic energy levels), (*Ground state, Perturbation theory), (*Excitation, Perturbation theory), Energy, Hamiltonian, Boundary value problems, Series, Wave functions, Transformations (Mathematics)

The bracketing theorem in the partitioning technique for solving the Schrodinger equation may be used in principle to determine upper and lower bounds to energy eigenvalues. Practical lower bounds of any accuracy desired may be evaluated by utilizing the properties of 'inner projections' on finite manifolds in the Hilbert space. The method is applied to the ground state and excited states of a Hamiltonian having a positive definite perturbation V. Even if inspiration is derived from the method of intermediate Hamiltonians, the final results are of bracketing type and independent of this approach. The method is numerically illustrated in some accompanying papers. (Author)

**AD-625 562 Fld. 20/10, 20/6**
*CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS*
**PHOTONS AND GRAVITONS IN PERTURBATION THEORY: DERIVATION OF MAXWELL'S AND EINSTEIN'S EQUATIONS.**
by Steven Weinberg. 7 Jan 65, 15p. Contract AF-AFOSR-232-63 AFOSR 65-1823
Unclassified report

*Availability: Published in The Physical Review v138 n4B pB988-B1002 24 May 1965. Copies to DDC users only.*

Descriptors: (*Photons, Field theory), (*Gravity, Field theory), (*Perturbation theory, S-matrix), Relativity theory, Quantum mechanics, Electromagnetism, Partial differential equations, Invariance

The S matrix for photon and graviton processes is studied in perturbation theory, under the restriction that the only creation and annihilation operators for massless particles of spin j allowed in the interaction are those for the physical states with helicity =j. The most general covariant fields that can be constructed from such operators cannot represent real photon and graviton interactions, because they give amplitudes for emission or absorption of massless particles which vanish for momentum p approaching 0. In order to obtain longrange forces it is necessary to introduce noncovariant 'potentials' in the interaction, and the Lorentz invariance of the S matrix requires that these potentials be coupled to conserved tensor currents, and also that there appear in the interaction direct current-current couplings, like the Coulomb interaction. We then find that the potentials for j=1 and j=2 must inevitably satisfy Maxwell's and Einstein's equations in the Heisenberg representation. It is shown that although the existence of magnetic monopoles is consistent with parity and time-reversal invariance (provided that P and T are defined to take a monopole into its antiparticle), it is nevertheless impossible to construct a Lorentz-invariant S matrix for magnetic monopoles and charges in perturbation theory. (Author)

**AD-625 571 Fld. 20/10**
*MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY*
**QUANTUM MECHANICS OF A MANY-BOSON SYSTEM AND THE REPRESENTATION OF CANONICAL VARIABLES**
by Hiroshi Ezawa. 13 Aug 64, 25p. Contract AF-AFOSR-500-64 ,NSF-GP-1193 AFOSR 65-1776
Unclassified report

*Availability: Published in Journal of Mathematical Physics v6 n3 p380-404. Copies to DDC users only.*

Descriptors: (*Quantum mechanics, Bosons), (*Bosons, N-body problem), Approximation (Mathematics), Operators (Mathematics), Oscillation, Potential theory, Perturbation theory, Hamiltonian, Statistical mechanics

A method is presented of treating the assembly of interacting bosons under Bose-Einstein condensation. Without applying the Bogoliubov approximation in which the creation and the annihilation operators of zeromomentum particles are replaced by a c number, we keep the quantum nature of these operators-thus the title, 'Quantum Mechanics'. The method is a quantum mechanical adaptation of the theory of small oscillation. The oscillation means the fluctuation of the number of condensed particles. The interaction between particles determineds the stability of this oscillation. When it is stable and its amplitude is not macroscopic, the Bogoliubov approximation is valid. In this way, the method provides a validity criterion for the Bogoliubov approximation as well as an estimation of the errors thereby committed. The excitations associated with the fluctuation of condensed particles can never by obtained within that approximation. The method is applied to the Huang model, the assembly of bosons interacting through a hard core plus weak attractive potential. Having found that, within the physically accessible range of the particle density, the abovementioned oscillation is stable, it is concluded that Huang's treatment is well founded. The mathematical background of the approximation is discussed by invoking the representation theory of canonical variables of an infinitely large system. (Author)

**AD-625 572 Fld. 20/10, 20/8**
*MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY*
**SELECTION RULES FOR PARAFIELDS AND THE ABSENCE OF PARA PARTICLES IN NATURE.**
Revised ed.,
by O. W. Greenberg, and A. M. L. Messiah. 2 Sep 64, 13p. Contract AF-AFOSR-500-64 ,NSF-GP-3221 AFOSR 65-1818
Unclassified report

*Availability: Published in The Physical Review v138 n5B pB1155-67 Jun 7 1965. Copies to DDC users only.*

Descriptors: (*Selection rules, Field theory), (*Field theory, Elementary particles), Quantum mechanics, Nuclear reactions, Hamiltonian, Perturbation theory, S-matrix, Bosons, Fermions

Green's parafield quantization is reviewed. It is shown, both for a single field and for sets of fields, that all Fock-like representations of Green's trilinear commutation rules are realized by Green's ansatz with anticommuting (commuting) Bose (Fermi) component fields for para-Bose (para-Fermi) fields. Restrictions on the form of the interaction Hamiltonian density, H (x) are derived from the requirement that H (x) be a paralocal operator. From these restrictions on H, selection rules on the S matrix are proved to all orders of perturbation theory. The most important such rule prohibits all reactions in which the total number of para particles of order p>1 in the initial and final states is one. This last selection rule, together with experimental information, leads to the conclusion that no presently known particle can be para. (Author)

**AD-625 594 Fld. 20/10, 12/1**
*CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS*
**A STUDY OF SOME APPROXIMATION SCHEMES IN QUANTUM MECHANICS,**
by Charles Schwartz. 6 Oct 64, 15p. Contract AF-AFOSR-130-63 AFOSR 65-2190
Unclassified report

*Availability: Published in Annals of Physics v32 n2 p277-91 Apr 1965. Copies to DDC users only.*

Descriptors: (*Quantum mechanics, Approximation (Mathematics), (*Approximation (Mathematics), Quantum mechanics), Hamiltonian, Field theory, Integral equations, Differential equations, Wave functions

By means of numerical examples in one dimensional Hamiltonian problems, the behavior of the approximation scheme known as the New Tamm-Dancoff method is studied. It is concluded that for good convergence of this, and other related methods, one should arrange to start with a symmetric set of equations. (Author)

**AD-625 597 Fld. 20/10, 12/1, 20/8**
*CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS*
**NUMERICAL SOLUTION OF FIXED-SOURCE FIELD THEORIES,**
by Charles Schwartz. 31 Aug 64, 7p. Contract AF-AFOSR-130-63 AFOSR 65-2191
Unclassified report

*Availability: Published in The Physical Review v137 n1B pB212-8 Jan 11 1965. Copies to DDC users only.*

Descriptors: (*Field theory, Meson scattering), (*Approximation (Mathematics), Wave functions), (*Meson scattering, Wave functions), Pions, Phase shift, Quantum mechanics

A modification of the Tamm-Dancoff method for fixed-source meson theories is set up for automatic computation. The Chew (1954) model of pion-nucleon interactions is calculated with up to six virtual mesons. Bound-state parameters and scattering phase shifts are obtained, accurate to about 1 %, at a cost of about 3 min of computer time each. (Author)

**AD-624 947** **See Fld. 20/6**

**AD-625 212** **See Fld. 7/4**

**AD-625 213** **See Fld. 7/4**

**AD-625 214** **See Fld. 7/4**

**AD-625 377** **See Fld. 7/4**

**AD-625 569** **See Fld. 20/8**

**AD-625 573** **See Fld. 20/8**

## 20/11. SOLID MECHANICS

**AD-624 924 Fld. 20/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**REFLECTION OF SPHERICAL ELASTIC WAVE FROM THE BOUNDARY OF SEMISPACE,**
by Kh. M. Aliev. 9 Nov 65, 12p. Rept. no. ftd-TT-65-994
TT 65-64827
Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n6 p88-92 1961.

Descriptors: (*Mechanical waves, Propagation), Elasticity, Stresses, Spheres, Mathematical analysis, Potential theory, USSR

**AD-624 995 Fld. 20/11**
**CFSTI Prices: HC $3.00 MF $0.75**
*MASSACHUSETTS INST OF TECH CAMBRIDGE AEROELASTIC AND STRUCTURES RESEARCH LAB*
**THEORETICAL CONSIDERATIONS OF PANEL FLUTTER AT HIGH SUPERSONIC MACH NUMBERS,**
by John Dugundji. Aug 65, 79p. Rept. no. asrl-TR-134-1
Contract AF49 (638)-1528 AFOSR 65-1907
Unclassified report

Descriptors: (*Flutter, Panels (Structural)), (*Supersonic flow, Flutter), Aeroelasticity, Damping, Stability, Two-dimensional flow

The general characteristics of panel flutter at high supersonic Mach numbers are examined theoretically. Linear plate theory and two-dimensional first order aerodynamics are used. The report attempts to clarify the important role of damping, the relationship between traveling and standing wave theories of panel flutter, and the effects of edge conditions. The solution procedures and general mathematical behavior may be of interest in other stability problems characterized by the appearance of complex eigenvalues. (Author)

**AD-625 052 Fld. 20/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EQUATIONS OF TRANSVERSE VIBRATIONS OF FLUID-FILLED SHELLS,**
by B. I. Rabinovich. 19 Oct 65, 12p. Rept. no. ftd-TT-65-869
TT 65-64836

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie, n1 p166-9 1964.

Descriptors: (*Equations of motion, Vibration), (*Vibration, Structural shells), Boundary value problems, Fluids, Dynamics, USSR

**AD-625 076 Fld. 20/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*BUREAU OF SHIPS WASHINGTON D C*
**STRESSED STATE AROUND A CIRCULAR HOLE IN A SHELL OF REVOLUTION WITH A SHALLOW MERIDIAN ARC,**
by A. N. Guz. Oct 65, 6p. Rept. no. buShips Trans. no. 943
TT 65-64859

Unclassified report

O Napriazhennom Sostoianii Okolo Krugovogo Otversyiya v Obolochke Vrasheniya s Pologoi Meridionalnoi Dugoi, trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie, n3 p142-4 1964.

Descriptors: (*Bodies of revolution, Stresses), (*Structural shells, Stresses), Torsion, USSR

**AD-625 147 Fld. 20/11, 13/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF LOAD ALTERNATION ON THE FATIGUE STRENGTH AND LONGEVITY OF COMPONENTS WITH AND WITHOUT STRESS CONCENTATION. COMMUNICATION II,**
by V. M. Grebenik, and V. F. Kucherenko. 3 Dec 65, 14p. Rept. no. ftd-TT-65-1071
TT 66-60008

Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Chernaya Metallurgiya (USSR) v7 n8 p188-94 1964.

Descriptors: (*Loading (Mechanics), Structural parts), (*Structural parts, Machines), USSR, Fatigue (Mechanics), Life expectancy, Stresses, Tests, Experimental data

**AD-625 152 Fld. 20/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**APPROXIMATE SOLUTION OF THE PROBLEM OF BENDING OF A SHALLOW SPHERICAL SHELL WEAKENED BY AN APERTURE,**
by N. Kh. Suyunshkaliev. 3 Dec 65, 20p. Rept. no. ftd-TT-65-1076
TT 66-60013

Unclassified report

Unedited rough draft trans. of Akademiya Nauk Uzbekskoi SSR, Tashkent. Izvestiya. Seriya Tekhnicheskikh Nauk, n3 p43-53 1964.

Descriptors: (*Elastic shells, Bending), (*Approximation (Mathematics), Bending), (*Bending, Structural shells), Spheres, Stresses, USSR

**AD-625 159 Fld. 20/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**APPLICATION OF THE METHOD OF DYNAMIC STIFFNESS FOR CALCULATION OF THE FREQUENCY OF NATURAL OSCILLATIONS OF COMPOSITE SHELLS,**
by I. E. Sakharov. 30 Nov 65, 15p. Rept. no. ftd-TT-65-1143
TT 66-60020

Unclassified report

Unedited rough draft trans. of mono. Vesesoyuznaya Konferentsiya po Teorii Oblochek i Plastii (no. 4) 24-31 Okt 62. Trudy, Erevan, 1964 p861-70. Teoriya Obolochek i Plastin.

Descriptors: (*Structural shells, Oscillation), USSR, Cylindrical bodies, Equations of motion, Dynamics, Loading (Mechanics), Composite materials

The method for solving problems of determining the frequency of natural oscillations in composite shells by means of the method of dynamic stiffness is as follows: by laying out several cross-sections, instead of a composite shell, difference shells of simple types (cylindrical, spherical, conical, etc.) are obtained. Forces (loads, moments) varying harmonically with an as-yet unknown frequency omega are introduced in the crosssections. The problems of the forced oscillations of each of the shells under the action of boundary loads are then solved. The end deflections found by solving these problems make up the dynamic stiffness, i.e., the ratio of load amplitudes to the amplitudes of the deflections caused by the loads. Then, with the law of equality of interaction and the conditions of compatible deformations, an equation is evolved for the frequency of the natural oscillations of composite shells.

**AD-625 162 Fld. 20/11, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**DIFFERENTIAL EQUATIONS OF ELASTIC EQUILIBRIUM OF SHELLS OF ROTATION WITH MERIDIONAL RIBS AT POWER AND TEMPERATURE LOADS,**
by L. O. Ilyin. 15 Dec 65, 18p. Rept. no. ftd-TT-65-1230
TT 66-60023

Unclassified report

Unedited rought draft trans. of Prykladna Mekhanika (USSR) v10 n3 p254-62 1964.

Descriptors: (*Elastic shells, Bodies of revolution), (*Differential equations, Elasticity), Temperature, Power, Deformation, Stresses, USSR

Discussed is a thin elastic shell of rotation with meridional ribs, which can be considered thin rods. All ribs are identical and the distance between them are uniform. Thickness of the shell and rigidity of the ribs may change along the meridian. The shell is subjected to the affect of power load and nonuniform heating, which possess cyclic symmetry, corresponding to the cyclicity of rib disposition. It is assumed, that the rib is connected with the shell along the line of intersection of the center of the surface with perpendicular to it plane, in which the axis of the rib lies. By dividing into trigonometric series the given loads and reactions forces affecting the shell its reactions with the ribs and expressions of the latter through displacements of the conjugation line of the shell with the ribs was obtained an infinite system of conventional differential equations relative to shell displacements. Limiting the number of members of the decomposition, from the mentioned system can be obtained a final system of equations, which describes approximately the discussed problem and it has a fully definite mechanical sense. (Author)

**AD-625 219 Fld. 20/11, 21/8.2**
**CFSTI Prices: HC $3.00 MF $0.75**
*CATHOLIC UNIV OF AMERICA WASHINGTON D C*
**FINITE DEFORMATIONS UNDER PRESSURIZATION IN AN INFINITELY LONG, THICK-WALLED, NONLINEARLY VISCOELASTIC CYLINDER IDEALLY BONDED TO A THIN ELASTIC CASE.**
Rept. on Applications of the Theory of Nonlinear Viscoelasticity to Solid Propellant Rocket Motors, by Ramesh N. Vaishnav, and Constantine Dafermos. Sep 65, 86p. Contract AF04 (611)-10388

Unclassified report

Sects. 1-3 and 10 constitute quarterly progress rept. no. 2; Sects. 4-9 constitute quarterly progress rept. no. 3.

Descriptors: (*Deformation, Elastic shells), (*Viscoelasticity, Cylindrical bodies), (*Rocket motors (Solid propellant), Materials), Continuum mechanics, Nonlinear systems, Solids, Pressure, Mathematical analysis

A constitutive equation for a nonlinearly viscoelastic, incompressible, Mooney-Voigt material is developed. Use is made of the equation to arrive at a nonlinear differential equation for the quasistatic finite-deformational response under internal pressurization of an infinitely long, thick cylinder of a nonlinearly viscoelastic material bonded to a linearly elastic thin case. Careful mathematical analysis of the differential equation is carried out. The equation is solved numerically for step and ramp pressure programs for a realistic set of data and the results are compared with those of the corresponding linearized program. Several peculiarities of the results of the nonlinear theory are discussed at length. (Author)

**AD-625 245 Fld. 20/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**STUDY OF LOCAL STRAIN DURING BENDING OF A HOLLOW SHAFT,**
by L. S. Burshtein. 8 Dec 65, 23p. Rept. no. ftd-TT-65-1121
TT 66-60051

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie n2 p123-9 1964.

Descriptors: (*Strain (Mechanics), Shafts), (*Shafts, Strain (Mechanics)), USSR, Bending, Deflection, Cylindrical bodies , Loading (Mechanics)

**AD-625 275 Fld. 20/11**
**CFSTI Prices: HC $3.00 MF $0.75**
*STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS*
**THE SNAP-THROUGH AND POSTBUCKLINGEQUILIBRIUM BEHAVIOR OF CIRCULAR CYLINDRICAL SHELLS UNDER AXIAL LOAD,**
by Wayne A. Madsen, and Nicholas J. Hoff. Apr 65, 77p. Rept. no. sudaer-227
Contract AF49 (638)-1276 Proj. 9782 Task 978201
AFOSR 65-1588

Unclassified report

Descriptors: (*Cylindrical bodies, Loading (Mechanics)), (*Structural shells, Loading (Mechanics)), Buckling (Mechanics), Strain (Mechanics), Stresses, Stability

The analysis was begun with an investigation of the effect that a more accurate displacement assumption, in conjunction with the exact strain-displacement relations, has on the postbuckling equilibrium behavior. It was hoped that the limiting behavior of wall thickness and wave number parameter would be altered, and that the stress coefficient would not tend to zero. Particular attention was given to an exact representation of membrane strains because it was known that in the limit as the radius-to-thickness ratio of the shell approaches infinity, the displacements approach the inextensional polyhedral surface. While all the strains in the middle surface of this limiting polyhedral shell are zero, the Donnell strain-displacement relations yield strains amounting to 0.1% if the number of waves around the circumference is 10. The results obtained did not differ significantly from the Donnell strain-displacement relations. (Author)

**AD-625 276 Fld. 20/11**
**CFSTI Prices: HC $3.00 MF $0.75**
*STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS*
**ELASTIC-PLASTIC ANALYSIS OF THE COLLAPSE OF UNIFORMLY COMPRESSED CIRCULAR CYLINDRICAL SHELLS,**
by Tsai-Chen Soong, and Nicholas J. Hoff. Apr 65, 58p. Rept. no. sudaer-231
Contract AF49 (638)-1276 Proj. 9782 Task 97801
AFOSR 65-1587

Unclassified report

Descriptors: (*Cylindrical bodies, Loading (Mechanics)), (*Structural shells, Loading (Mechanics)), Compressive properties, Elasticity, Plasticity, Strain (Mechanics), Membranes, Elastic shells, Buckling (Mechanics), Geometric forms, Performance (Engineering)

A new geometric form is proposed as a large-displacement buckling pattern of a circular cylindrical shell of finite length simply supported at the ends and subjected to axial compressive load. Exact expressions are derived for displacements and membrane strains. They show that the new pattern is almost entirely free of membrane strain. During buckling plastic yield hinges are assumed to develop which form ridges separating the mostly flat buckled surfaces. The buckling load and the postbuckling load are calculated from the energy balance and from a compatibility condition of the displacements of test specimen and elastic testing machine. (Author)

**AD-625 297 Fld. 20/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**OSCILLATIONS AND STABILITY OF A TRIPLE LAYER CYLINDRICAL SHELL WITH INCOMPRESSIBLE IDEAL LIQUID,**
by V. V. Stepanyuk. 15 Dec 65, 15p. Rept. no. ftd-TT-65-1252
TT 66-60075

Unclassified report

Unedited rough draft trans. of Prikladnaya Mekhanika (USSR) v1 n2 p78-85 1965.

Descriptors: (*Pipes, Fluid dynamic properties), (*Cylindrical bodies, Motion), (*Structural shells, Motion), Oscillation, Stability, Incompressible flow, Liquids, USSR, Mathematical analysis

A discussion is given of oscillations of a compound cylindrical shell of finite length, consisting of two isotropic coaxially smooth shells, rigidly soldered together by the generatrixes in contact points, with the coaxially corrugated shell situated between them. Along the pipes, formed by one of the external shells and the corrugated wave, flows an ideal incompressible liquid. The purpose of the report is the determination of the effect of liquid flow on shell oscillations.

**AD-625 408 Fld. 20/11**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE*
**HARMONIC WAVE PROPAGATION IN ELASTIC RODS OF ELLIPTICAL CROSS-SECTION.**
Technical rept.,
by P. K. Wong, J. Milowitz, and R. A. Scott. Nov 65, 33p. Rept. no. tr-2
Contract Nonr-220 (57) Proj. NR-064-487

Unclassified report

Descriptors: (*Mechanical waves, Propagation), (*Potential theory, Mechanical waves), Rods, Elasticity, Harmonic analysis, Equations of motion

Using the potential equations of motion of linear elasticity, the propagation of harmonic waves in an infinite isotropic rod of elliptical cross-section is investigated. Three modes of motion are found to exist, corresponding to longitudinal, flexural, and torsional modes in a circular rod. The frequency equation for a flexural case is obtained in the form of an infinite determinant (set equal to zero), the elements of which involve Mathieu functions and their derivatives. It is shown that this determinant can be written in diagonal form when the eccentricity goes to zero, the diagonal elements describing the propagation of harmonic flexural and circumferential modes (of odd order) in a circular rod. Finally, some possible numerical procedures are discussed. (Author)

**AD-625 441 Fld. 20/11**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**THE RESPONSE OF A BEAM TO AN IMPACT LOADING.**
Master's thesis,
by Thomas Jerome Higgins,III.. Jun 65, 65p.
Rept. no. gaw/mech/65-27

Unclassified report

Descriptors: (*Beams (Structural), Loading (Mechanics)), (*Loading (Mechanics), Impact tests), Theory, Vibration, Stresses, Analysis of variance

The thesis discusses several theories which have been used to describe the response of a beam to an impact loading. Several of these theories were developed for steady state applications but have been used to estimate the response due to an impact loading. The response of the beam is divided into three phases and the conclusion is reached that each phase of the response is best described by a different theory. (Author)

**AD-625 468 Fld. 20/11**
**CFSTI Prices: HC $2.00 MF $0.50**
*BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING*
**AN EXPERIMENTAL INVESTIGATION OF ELASTICPLASTIC PULSE PROPAGATION IN ALUMINUM RODS AT ELEVATED TEMPERATURES.**
Technical rept.,
by S. R. Bodner, and R. J. Clifton. Sep 65, 40p.
Rept. no. tr-44
Contract Nonr-562 (20) ,SD-86 Proj. NR-064-424

Unclassified report

Descriptors: (*Loading (Mechanics), Aluminum), (*Mechanical waves, Propagation), Rods, Plasticity, Elasticity, Stresses, Strain (Mechanics), Deformation, Compressive properties, High-temperature research

Experiments are reported involving explosive loading at one end of long, annealed, commercially pure, aluminum rods at temperatures up to 750F. The stress waves are detected by a condenser microphone at the far end of the rod and, in some cases, by strain gages at a cross-section distant from the impact end. The essential features of the recorded velocity-time profiles and strain-time profiles are in agreement with the predictions of a rate independent elastic-plastic theory which takes a Bauschinger effect into account. At room temperature, the reference dynamic stress-strain curve does not differ appreciably from the quasi-static stress-strain curve whereas at elevated temperatures there appears to be a marked difference between the dynamic and quasi-static stress-strain curves. Since the maximum plastic strains are small at cross-sections remote from the impact end the measurements, and consequently the conclusions, are limited to small strains beyond the proportional limit. (Author)

**AD-625 517 Fld. 20/11, 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*REDSTONE SCIENTIFIC INFORMATION CENTER REDSTONE ARSENAL ALA*
**EQUATIONS FOR THE PERTURBED MOTION OF A RIGID BODY WITH A CYLINDRICAL CAVITY PARTIALLY FILLED WITH LIQUID,**
by B. I. Rabinovich. Nov 65, 21p. Rept. no. rsic-476
TT 66-60093

Unclassified report

Trans. of Prikladnaya Matematika i Mekhanika (USSR) v10 n2 p39-50 1954.

Descriptors: (*Equations of motion, Structural shells), Fluids, Dynamics, Potential theory, Boundary value problems, USSR

Equations are derived for the perturbed motion of a rigid body with a cylindrical cavity, the axis of which is inclined by a small angle from the direction of the field of external mass forces. As a result, the equations of motion are simplified due to the elimination of certain sums containing an infinite set of terms. (Author)

**AD-625 568 Fld. 20/11, 20/2, 20/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**ELECTRICAL EFFECTS OF SHOCK WAVES: CONDUCTIVITY IN CSI, KI, AND NACL.**
Final rept.,
by W. Murri, and D. G. Doran. 31 Jan 65, 79p.
Contract DA-04-200-ORD-1279 Proj. sri-PGU-4100

Unclassified report

Descriptors: (*Shock waves, Resistance (Electrical)), (*Iodides, Resistance (Electrical)), (*Chlorides, Resistance (Electrical)), Cesium compounds, Potassium compounds, Sodium compounds, Electrical conductance, Crystal structure, Single crystals

The electrical resistivities of single crystal NaCl, KI, and CsI were measured at several shock pressures in the range from 120 to 300 kbar. The resistivity of NaCl remained > 9000 omega-cm at 225 kbar. One shot in which the specimen was preheated to 480C and shocked to 244 kbar gave an averaged resistivity of 470 omega-cm. The resistivity of KI decreased to a value between 2 and 9 omega-cm at 241 kbar; there is considerable scatter in the data below 190 kbar. Resistivity measurements on CsI were performed parallel and perpendicular to the direction of shock propagation; the resistivity decreased to 2 omega-cm at 277 kbar in the first case and to approx. 0.2 omega-cm in the letter. The data suggest a dependence of the conductivity on crystallographic direction. The data are consistent neither with electronic conduction caused by a decrease in the band gap due to shock compression of the lattice nor with ionic conduction caused by melting which may occur behind the shock front. (Author)

**AD-625 329** **See Fld. 11/9**

AD-625 331 See Fld. 11/9

AD-625 339 See Fld. 13/10

AD-625 340 See Fld. 5/1

## 20/12. SOLID STATE PHYSICS

**AD-624 884 Fld. 20/12, 8/1, 7/3, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*CONTROLS FOR RADIATION INC CAMBRIDGE MASS*
**INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIES IN ORGANIC AND INORGANIC MATERIALS.**
Final rept. 15 Jun 64-15 Jun 65,
by Paul A. Andrews, Sumner Mayburg, and James A. Wall. 15 Jun 65, 48p. Contract AF19 (628)-4240 Proj. AF-5620 Task 562004
AFCRL 65-720

Unclassified report

Descriptors: (*Phenanthrenes, Resistance (Electrical)), (*Polyethylene plastics, Zone melting), (*Solar cells, Electron bombardment), (*Silicon, Electron bombardment), (*Electron bombardment, Semiconductors), Radiation damage, Purification, Naphthalenes, Anthracenes, Alkynes, Single crystals, Pyrolysis, Selenium, Pellets, Transistors, Damage, Organic materials

Phenanthrene was purified by zone-refining methods and the resistivity of the material was determined as a function of temperature. A discontinuity in the resistivitytemperature curve was observed at about 68C for both compressed polycrystalline pellets and single crystals, and this discontinuity was intensified in the purer portions of the material. Various possible explanations are discussed. Attempts to zone-refine low- and high-density polyethylene resulted in a brittle material which cracked on cooling. No segregation of impurities was observed. Electron irradiation of both silicon and selenium solar cells indicated that silicon cells are more resistant to radiation damage than selenium cells. Carrier removal in silicon appears to be responsible for the radiation induced fluctuation in the base resistance and emitter efficiency of silicon transistors. (Author)

**AD-624 981 Fld. 20/12, 20/2, 20/3**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS*
**AMPLIFICATION OF MAGNETOELASTIC WAVES IN YTTRIUM IRON GARNET AT 300K,**
by R. L. Comstock, and J. J. Raymond. 6 Jul 65, 2p.

Unclassified report

*Availability: Published in Proceedings of the IEEE v53 n9 p1270-1 Sep 1965. Copies to DDC users only.*

Descriptors: (*Garnet, Mechanical waves), (*Mechanical waves, Ferromagnetic materials), Magnetic properties, Yttrium compounds, Iron compounds, Single crystals, L band, Pumping (Electronics), Parametric amplifiers

Experiments are presented concerning the parametric generation and amplification of magnetoelastic waves in a single-crystal yttrium iron garnet (YIG) cylinder at L-band at room temperature. In the present experiments, the magnetoelastic waves in the YIG cylinder are coupled to the RF fields from the short-circuited center conductors of two coaxial transmission lines, as shown in Fig. 1. The center conductor for the signal at omega sub p (the pumping signal) is approximately one third of the length from the cylinder face, and the pumping signal RF magnetic fields are parallel to the cylinder axis. The RF magnetic fields from the signal to be amplified at omega sub p/2 are transverse to the cylinder axis. The receiver had a bandwidth of 5 Mc/s and a minimum detectable signal of -75 dBm, and was always tuned to omega sub p/2.

**AD-625 017 Fld. 20/12**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**SPIN-ORBIT INTERACTION IN GRAPHITE,**
by G. Dresselhaus, and M. S. Dresselhaus. 3 May 65, 13p. Rept. no. ja-2550
Contract AF 19 (628)-5167 ESD TDR-65-550

Unclassified report

*Availability: Published in The Physical Review v140 N1A Pa401-12 Oct 4 1965. Copies to DDC users only.*

Descriptors: (*Band theory of solids, Graphite), (*Graphite, Electron spin resonance), Atomic orbitals, Brillouin zones, Symmetry (Crystallography), Hamiltonian, Electron transitions, Selection rules

Using symmetry arguments, the effective-mass Hamiltonian including spin-orbit interaction is derived for energy bands with extrema near the vertical edge of the hexagonal prism which represents the Brillouin zone of graphite. The energy bands in the plane normal to the vertical edge are described by k.p perturbation theory, whereas along the edge a Fourier expansion is used for all the matrix elements. It is shown that spin-orbit interaction lifts all band degeneracies (other than the Kramers degeneracy), and affects the graphite Fermisurface topology at the Brillouin-zone boundary where two de Haas-van Alphen periods are predicted. Magnetic energy levels for a static magnetic field are obtained by solution of the effective-mass Hamiltonian. Selection rules for infrared interband transitions are discussed. An evaluation of the spin-orbit band parameters is suggested by analysis of structure in the lowquantum-limit magnetoreflection data and of the lowfrequency de Haas-van Alphen oscillations. (Author)

**AD-625 105 Fld. 20/12, 20/3**
*EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)*
**THE EFFECT OF PRESSURE ON THE FERROMAGNETIC PHASE TRANSITION OF EUO,**
by Richard Stevenson, and M. C. Robinson. 17 Jun 65, 7p.

Unclassified report

*Availability: Published in Canadian Journal of Physics v43 p1744-9 Oct 1965. Copies to DDC users only.*

Descriptors: (*Europium compounds, Oxides), (*Ferromagnetism, Europium compounds), (*Phase studies, Europium compounds), Canada, Pressure, Transition temperature, Oxides, Cryogenics, High pressure research

The compressions of EuO up to 10 000 atm have been measured at 296K, 82K, and 4.2K. The shift in temperature of the ferromagnetic phase transition has been measured as a function of pressure by measuring the mutual inductance of a coil containing the solid. The transition occurs at about 72K at 10 000 atm, which is about 5K higher than the transition at atmospheric pressure. The results tend to substantiate the molecular field model for EuO proposed by McGuire and Shafer. An estimate is made of the variation of the exchange interaction parameter with lattice parameter, delta J sub 1/delta a = -0.62K/A, where J sub 1 refers to interactions between nearest magnetic neighbors. (Author)

**AD-625 153 Fld. 20/12, 20/6, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**SEMICONDUCTING AND OPTICAL PROPERTIES OF DITHIOCARBAMATES OF COPPER, NICKEL, ZINC AND CADMIUM,**
by A. P. Terentev, and V. M. Vozkhennikov. 3 Dec 65, 10p. Rept. no. ftd-TT-65-1109
TT 66-60014

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady v160 n2 p405-8 1965.

Descriptors: (*Semiconductors, Chelate compounds), (*Chelate compounds, Semiconductors), Copper compounds, Nickel compounds, Zinc compounds, Cadmium compounds, Organic sulfur compounds, Carbamic acids, Optical properties, Electrical properties, Absorption spectrum, Heat of activation, USSR

**AD-625 166 Fld. 20/12, 20/5, 20/2**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SOLID STATE SCIENCES LAB*
**CHARACTERISTIC FREQUENCIES FROM INFRARED AND ELASTIC DATA.**
Physical sciences research papers,
by Johannes N. Plendl, and Peter J. Gielisse. 22 Dec 64, 13p. Rept. no. psrp-135
Proj. AF-5621 Task 562105
AFCRL 65-677

Unclassified report

*Availability: Published in Applied Optics v4 p853-6 Jul 1965. Copies to DDC users only.*

Descriptors: (*Infrared spectroscopy, Solid state physics), (*Solid state physics, Infrared spectroscopy), (*Elasticity, Solid state physics), Solids, Dielectric properties, Metallic crystals, Compressive properties, Specific heat, Tables, Crystal lattices, Vibration

The concept of a characteristic frequency from infrared data has been compared with elastic data for dielectric solids. A relationship between the characteristic centro-frequency and a similar frequency derived from purely elastic data has been established. The application to metallic solids is reviewed. (Author)

**AD-625 169 Fld. 20/12, 20/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SOLID STATE SCIENCES LAB*
**EFFECTS OF EXPERIMENTAL PARAMETERS ON THERMOLUMINESCENCE OF A TYPE II-A DIAMOND.**
Physical sciences research papers,
by Albert D. Johnson, and James R. Littler. Oct 65, 40p. Rept. no. psrp-153
Proj. AF-5621 Task 562104
AFCRL 65-749

Unclassified report

Descriptors: (*Crystal lattice defects, Luminescence), (*Diamonds, Crystal lattice defects), Heat of activation, Electron transitions, Crystals, Electron capture, Thermal conductivity, Recombination reactions

Thermoluminescence provides a method for studying properties of those crystalline imperfections which behave as electron traps and recombination centers in wide bandgap materials. This approach, however, has been used relatively little, possibly due to the fact that the shapes and intensities of thermoluminescent glow curves are functions of several experimental parameters and are often complicated by the overlapping of a number of individual glow peaks. In the present work, experimental parameters were isolated and some of their effects on thermoluminescent glow curves were analyzed. This yielded information on activation energies associated with trapping levels, the nature of the kinetics involved in electron transitions, and electron retrapping. A Type II-a diamond, which has a wide distribution of thermoluminescent glow peaks, was used in this work. (Author)

**AD-625 215 Fld. 20/12**
**CFSTI Prices: HC $1.00 MF $0.50**
*CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS*
**RESEARCH ON SOFT X-RAY ABSORPTION.**

Final rept.,
by D. H. Tomboulian, and D. F. Holcomb. 9 Dec 65, 7p. Contract Nonr-401 (37)
Unclassified report

Descriptors: (*X-ray absorption analysis, Scientific research), Ionization, Solid state physics

A brief summary is given of work performed on soft x-ray absorption. Technical reports, publications and other communications are listed.

**AD-625 428 Fld. 20/12, 11/6**
**CFSTI Prices: HC $3.00 MF $0.75**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS RESEARCH LAB*
**PHASE EQUILIBRIUM STUDIES OF GERMANIUM AND SILICON AT HIGH PRESSURES.**
Technical rept. (Doctoral thesis),
by Carl Hobart Bates. Mar 66, 79p. Rept. no. tr-22
Contract Nonr-656 (20)
Unclassified report

Descriptors: (*Germanium, Phase studies), (*Silicon, Phase studies), High-pressure research, Transition temperature, Germanium alloys, Silicon alloys, Reaction kinetics, Crystal structure, Optical analysis, Spectroscopy

The phase relations of the high pressure polymorphic modifications of germanium were studied up to pressures of 150 kbars with the use of the opposed anvil apparatus. Long times at pressure (up to 6 weeks) favored the attainment of equilibrium and enabled the preparation of a new high pressure phase Ge-IV with the body centered cubic structure. The triple point between Ge-I (diamond structure), Ge-III (body centered tetragonal) and Ge-IV (body centered cubic) has been established at 75 kbars and 430C. A good estimate of the triple point between Ge-I, Ge-IV and liquid is 93 kbars and 630C. Another new phase with the simple cubic structure has been detected for the first time although its relations to the other polymorphs of germanium has not been established. Extension of this work into the Ge-Si system enabled onstruction of a 150C isothermal section and a 10 mole % Si isoplethal section through the P-T-X-volume for the system. (Author)

**AD-625 471 Fld. 20/12, 20/14, 20/1, 9/4**
**CFSTI Prices: HC $4.00 MF $1.00**
*UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES ELECTRONIC SCIENCES LAB*
**CONSOLIDATED SEMIANNUAL PROGRESS REPORT NO. 2, 1 APRIL 1965 THROUGH 30 SEPTEMBER 1965,**
by Z. A. Kaprielian. 30 Sep 65, 144p.
Unclassified report

Descriptors: (*Solid state physics, Scientific research), (*Electromagnetic waves, Scientific research), (*Plasma physics, Scientific research), (*Information theory, Scientific research), Electronics laboratories, Semiconductors, Magnetism, Magnetic resonance, Crystal lattice defects, Superconductivity, Scattering, Sound waves, Millimeter waves, Control systems, Data processing systems, Coding, Theory

The report summarizes the research activity conducted during the period April 1965 - September 1965. Topics includes: Solid state (Semiconductors, Magnetism, imperfections in crystals, superconductivity); Applied electromagnetics, acoustics and plasmas (plasmas, radiation and diffraction of electromagnetic waves, scattering from underwater objects, millimeter waves); Information sciences (control systems, information processing and signal detection, hybrid and digital computation, coding theory, optical processing).

**AD-625 476 Fld. 20/12**
**CFSTI Prices: HC $3.00 MF $0.50**
*BROWN UNIV PROVIDENCE R I METALS RESEARCH LAB*
**PHYSICAL RESEARCH ON PROPERTIES OF II-VI COMPOUND SEMI CONDUCTORS.**
Final rept., Apr 62-Apr 65,
by Charles Elbaum, Arthur Lord, and Rhon Truell. Jun 65, 52p. Contract AF33 (657)-8317 Proj. AF-7885 Task 788503
ARL 65-123
Unclassified report

Descriptors: (*Semiconductors, Solid state physics), (*Cadmium compounds, Sulfides), Ultrasonic properties, Electrical properties, Mechanical waves, Stresses, Ultrasonic radiation, Damping, Harmonic generators, Temperature, Piezoelectric effect, Annealing

The work described in this report was concerned primarily with ultrasonic and electrical measurements made on cadmium sulphide single crystals for the purpose of studying the interaction of high frquency stress waves with charge carriers. The temperature dependence of ultrasonic attenuation, above room temperature, was found to follow the predicted dependence on the density of thermally excited charge carriers. The generation of the second harmonic of an ultrasonic wave has been studied as a function of light intensity (density of charge carriers). The amplitude of the second harmonic generally increases initially with increasing light intensity and then reaches a saturation value or broad maximum. The general behavior of the second harmonic is quite complicated and it cannot at present be fitted with any simple formalism of nonlinear phenomena in solids. Measurements of electrical resistivity as a function of position in the sample and as a function of localized illumination reveal very substantial inhomogeneity in response to light of all the specimens studied thus far. The transducing properties of cadmium sulphide have been found to depend on heat treatment through the formation of surface films which can be mechanically removed and reformed. (Author)

**AD-625 544 Fld. 20/12**
**CFSTI Prices: HC $1.00 MF $0.50**
*RUTGERS-THE STATE UNIV NEW BRUNSWICK N J DEPT OF PHYSICS*
**RELAXATION OF DILUTED NICKEL FLUOSILICATE AT LOW TEMPERATURES BY STEADY-STATE RESONANCE ABSORPTION TECHNIQUES.**
Technical rept., Feb 65-Jan 66,
by Shyam H. Gurbaxani. 27 Dec 65, 13p. Contract Nonr-404 (20) Proj. NR-018-401
Unclassified report

Descriptors: (*Nickel compounds, Relaxation time), (*Fluorine compounds, Relaxation time), (*Silicates, Relaxation time), Crystal lattices, Nuclear spins, Paramagnetic materials, Electron spin resonance, Zinc compounds, Magnetic fields

Relaxation rates from spin-lattice interaction were measured by the steady-state saturation of 3-cm microwaves in electron spin resonance at liquid-helium temperature for the paramagnetic material nickel fluosilicate. The absolute values of the relaxation time were in agreement with those found earlier in pulse measurements. The temperature dependence of the relaxation rate indicated that the direct process dominates. The relaxation rate decreases sharply when the magnetic concentration of the magnetic ions is reduced. The dependence of absorption signal of the microwave input power was that appropriate to homogeneously broadened lines, despite the fact that the lines of nickel fluosilicate have been thought to be inhomogeneously broadened. This behavior is interpreted in terms of the dominant role of cross relaxation processes. (Author)

**AD-625 550 Fld. 20/12, 11/2, 20/2**
*MINNESOTA UNIV MINNEAPOLIS DEPT OF CHEMISTRY*
**POINT DEFECTS IN MAGNESIUM OXIDE,**
by J. E. Wertz, G. S. Saville, L. Hall, and P. Auzins. 1964, 14p. Contract AF-AFOSR-200-63 Proj. AF-9761 Task 976103
AFOSR 65-1762
Unclassified report

*Availability: Published in Proceedings of the British Ceramic Society n1 p59-70 Jul 1964. Copies to DDC users only.*

Descriptors: (*Crystal lattice defects, Magnesium compounds), (*Magnesium compounds, Oxides), (*Electron spin resonance, Absorption spectrum), Color centers, Impurities, Concentration (Chemistry), Band theory of solids

Electron spin resonance provides a means of detecting numerous defect centers as well as a means of constructing models for them. A model involving nextnearest-neighbor vacancy association is proposed for a titanium center. A center resulting from heating MgO in hydrogen has been detected by its strong doublet absorption at 3300/cm. Using the esr spectrum of F centers to monitor their concentration through a series of bleaching experiments, it has been possible to assign the 5 ev optical absorption band to F centers. Marked resemblances of neutron-irradiated MgO spectra with recent alkali halide F aggregate spectra are noted and discussed in relation to lattice vibration frequencies. (Author)

**AD-625 578 Fld. 20/12, 20/8**
*SYRACUSE UNIV N Y*
**NUCLEAR SPIN RELAXATION IN PI-TYPE INSB AT LIQUID-HELIUM TEMPERATURES,**
by J. Hofland, and A. Honig. 4 Mar 65, 7p. Contract AF-AFOSR-425-63 Proj. AF-9763 Task 976302
AFOSR 65-1904
Unclassified report

*Availability: Published in Physical Review Letters v14 n17 p700-4 Apr 26 1965. Copies to DDC users only.*

Descriptors: (*Nuclear spins, Relaxation time), (*Semiconductors, Crystal lattices), Indium alloys, Cryogenics, Indium, Impurities, Magnetic fields, Carriers (Semiconductors)

The spin-lattice relaxation rate of In115 nuclei in the semiconductor InSb was studied and explained for samples ranging in net acceptor impurity concentration from 10 to the 14th power/cc to 10 to the 17th power/cc. The temperature dependence of the relaxation rate between 1.0 and 4.2K was determined as well as the magnetic field dependence between 300 Oe and 10 kOe. Three distinct relaxation mechanisms were found, which are operative singly in each of 3 different concentration regions. It is hypothesized that the relaxation in the lowconcentration region arises from the Bloembergen mechanism. The intermediate-concentration mechanism has special properties but is related to the low concentration relaxation mechanism. A theory for the expression of relaxation governed by fast centers and nuclear spin diffusion is discussed which is applicable to both concentration regions. Brief consideration is also given to the high concentration sample. (Author)

**AD-624 878** See Fld. 20/3

**AD-624 912** See Fld. 11/4

**AD-624 935** See Fld. 20/5

**AD-624 989** See Fld. 7/2

**AD-625 023** See Fld. 20/2

**AD-625 096** See Fld. 20/13

**AD-625 098** See Fld. 20/2

**AD-625 146** See Fld. 7/2

AD-625 198 See Fld. 10/1

AD-625 302 See Fld. 7/4

AD-625 330 See Fld. 11/9

AD-625 341 See Fld. 18/8

AD-625 343 See Fld. 7/4

AD-625 370 See Fld. 9/5

AD-625 420 See Fld. 9/5

AD-625 531 See Fld. 9/1

AD-625 533 See Fld. 9/1

## 20/13. THERMODYNAMICS

**AD-624 959 Fld. 20/13**
*NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING*
**A STUDY OF THERMAL TRANSPIRATION USING ULTRAHIGH VACUUM TECHNIQUES,**
by T. Edmonds, and J. P. Hobson. 19 Jan 65, 17p. NRC 8530
Unclassified report

*Availability: Published in The Journal of Vacuum Science and Technology v2 n4 p182-97 Jul-Aug 1965. Copies to DDC users only.*

Descriptors: (*Kinetic theory, Measurement), Thermal properties, Helium, Argon, Pressure, Vacuum, Molecules, Pipes, Canada, Adsorption

The thermal transpiration ratio R = P1/P2 was measured by the absolute method in helium and neon over the pressure range 10 to the -9th power < or = P2 < or = 60 Torr. Cold temperature were T1=77.4K and 232K with warm temperature T2 = 295K. An aperture and various tubes were used at the temperature interface. For the aperture R sub m = (T1/T2) to the 1/2 power was found, as expected, at low pressures but this value was not found, in general, for tubes. The latter case represents a departure from normal assumptions, which are examined in detail. A related conclusion is that the relative method for measuring R is unreliable for tubes at low pressures. It is concluded that a molecule has a greater probability of traversing a tube from the hot end to the cold end than in the opposite direction. It is found that several analytic expressions for R represent the data satisfactorily after suitable choice of constants. (Author)

**AD-625 095 Fld. 20/13, 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*CINCINNATI UNIV OHIO DEPT OF AEROSPACE ENGINEERING*
**MEASUREMENT OF THE HEAT TRANSFER TO A TWO-DIMENSIONAL HYPERSONIC INLET WITH VARIABLE GEOMETRY.**
Technical rept.,
by Widen Tabakoff, and James D. McDonel.
Nov 65, 41p. Rept. no. tr-AE-6505
Contract AF33 (616)-8453 Proj. 7064
Unclassified report

Descriptors: (*Heat transfer, Aerodynamic heating), (*Duct inlets, Hypersonic flow), Two-dimensional flow, Models (Simulations), Laminar boundary layer, Numerical analysis, Geometric forms, Measurement

The report describes the experimental measurement of aerodynamic heat transfer to a two-dimensional variable geometry hypersonic inlet model. The program was conducted in a twenty-inch hypersonic tunnel. Testing was at a nominal free stream Mach number of 14 and free stream Reynolds numbers of 721,000 and 631,000 per foot. The experimental results are compared to an approximate theoretical solution for laminar boundary layer flow over a flat plate. (Author)

**AD-625 096 Fld. 20/13, 20/12, 7/2, 11/2**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**HEAT CAPACITY AND THERMODYNAMIC PROPERTIES OF BERYLLIUM ALUMINATE (CHRYSOBERYL), BEO-A1203, FROM 16 TO 380K,**
by George T. Furukawa, and William G. Saba.
6 Oct 64, 6p. Proj. arpa order-20 AFOSR 65-1786
Unclassified report

*Availability: Published in Journal of Research of the National Bureau of Standards-A. Physics and Chemistry v69A n1 p13-8 Jan-Feb 65. Copies to DDC users only.*

Descriptors: (*Beryllium compounds, Aluminates), (*Thermodynamics, Beryllium compounds), Thermal properties, Temperature, Cryogenics, Ceramic materials

The heat capacity of beryllium aluminate (chrysoberyl), BeO . Al2O3, was determined from 16 to 380K and the thermodynamic properties calculated from 0 to 380K. (Author)

**AD-625 203 Fld. 20/13**
**CFSTI Prices: HC $4.00 MF $0.75**
*OKLAHOMA UNIV NORMAN SCHOOL OF AEROSPACE AND MECHANICAL ENGINEERING*
**RADIATIVE HEAT TRANSFER BETWEEN PARALLEL PLATES SEPARATED BY A NON-ISOTHERMAL MEDIUM ANISOTROPIC SCATTERING.**
Interim technical rept., Feb 64-Mar 65,
by Tom J. Love, and Han Min Hsia. Oct 65, 106p. Contract AF33 (657)-8859 Proj. AF-7063 Task 706303
ARL 65-211
Unclassified report

Descriptors: (*Heat transfer, Thermal radiation), Differential equations, Scattering, Particles, Matrix algebra, Separation

The problem of radiative heat transfer is considered for the case of partially reflecting parallel plates separated by an emitting, nonisothermal medium which scatters radiant energy in an anisotropic fashion. Both linear and parabolic temperature profiles are considered. The solutions are obtained by representing the integral term of the transport equation by a quadrature. The resulting set of non-homogeneous differential equations are solved by a method utilizing idempotents. Application of this method to problems involving spherical enclosures is discussed. (Author)

**AD-625 267 Fld. 20/13, 13/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF*
**IMPROVED HEAT TRANSFER IN MULTI-STAGE FLASH EVAPORATION.**
Technical rept.,
by E. J. Beck. Dec 65, 29p. Rept. no. tr-413
Proj. NCEL-Y-R011-01-01-082
Unclassified report

Descriptors: (*Heat transfer, Evaporation), (*Evaporation, Heat transfer), Films, Evaporators, Condensation, Distillation, Sea water

A study was made to explore the promising methods for improvement of multistage flash evaporators for the production of potable water from contaminated sources. The nature of the cycle is such that it is clearly limited by the heat-transfer processes. Of the available methods for improving heat transfer simply and reliably, it was concluded that the use of a convoluted heat-transfer wall which produces thin films on both surfaces showed the greatest promise. High heat-transfer rates had previously been reported for such a surface, but measurements had not been reported which allowed detailed assessment of the total picture. This report gives the details of a surface with small convolutions and the results of laboratory experiments to isolate the film coefficients on the two sides of the heat-transfer surface. A second experiment allowed direct measurement of an identical surface on the low-temperature side only, using a 'cat whisker' thermocouple search technique. (Author)

**AD-625 363 Fld. 20/13**
*IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER*
**FORCED VAPORIZATION OF WATER,**
by Ted A. Erikson. 1962, 4p. Contract AF49 (638)-1121 AFOSR 65-2260
Unclassified report

*Availability: Published in Fundamentals p351-4. Copies to DDC users only.*

Descriptors: (*Water, Vaporization), Evaporation

The usual Hertz-Knudsen relation derived for the rate of evaporation of pure liquids is given by n= (2 pi MRT sub s) to the -1/2 power (P sub s -P). The rate of evaporation is shown to be represented as well if not better, by a relation derived from a classical thermodynamic treatment of the forced vaporization of water as a steady-rate process. On the basis of this derivation, the mass flow is described by the equation n = 1/N sub A ln (P to the zero power/P). (Author)

**AD-625 367 Fld. 20/13, 13/1**
*AEROCHEM RESEARCH LABS INC PRINCETON N J*
**TRANSPIRATION COOLING WITH CHEMICAL REACTIONS,**
by Daniel E. Rosner. 1965, 27p. Contract AF49 (638)-1138 AFOSR 65-2266
Unclassified report

Revised version of AeroChem Research Labs., TP-79 (Jan 64), AD-429 355, NASA N64-15702.

*Availability: Published in Pyrodynamics v2 p221-47 1965. Copies to DDC users only.*

Descriptors: (*Evapotranspiration, Cooling), (*Cooling, Evapotranspiration), Convection (Heat transfer), Chemical reactions, Coolants, Reaction kinetics, Decomposition, Numerical methods and procedures, Phase studies, Fluid mechanics, Thermodynamics

Transpiration coolant requirements are examined for gas/solid systems in which the thermal effects of chemical reactions must be taken into account. Protecting a surface by actually passing the coolant through it is known to be a highly efficient technique and may provide the only feasible method of preventing material failures in regions of extreme convective heat flux. While transpiration cooling has not in the past provided a practical solution to some problems (e.g., turbine rotor blades) owing largely to structural considerations, the approach holds promise for non-rotating systems (e.g., stators, ramjet components) in which the dominant heating mechanism is convective. In the present paper, for example, a coolant may undergo phase change and chemical decomposition in passage through the wall itself. This would alter the effective heat absorption capability of the coolant and the mean molecular weight of the effluent gas. Further chemical reaction may occur when the coolant vapors (or decomposition products) mix with the hot gases in the external boundary layer. In general, both processes will (i) influence the amount of coolant required to maintain a prescribed surface temperature, and therefore (ii) significantly alter the relative merits of possible coolants. (Author)

**AD-625 455 Fld. 20/13**
**CFSTI Prices: HC $2.00 MF $0.50**

*CALIFORNIA UNIV RIVERSIDE DEPT OF CHEMISTRY*
**THERMODYNAMICS OF THE LIQUID-LIQUID CRITICAL MIXING REGION.**
Final rept. 5 Mar 58-31 Dec 63,
by Hartland H. Schmidt, and Jack Opdycke. 15 Feb 65, 38p. Contract AF49 (638)-284 AFOSR 64-1758 Unclassified report

Descriptors: (*Phase studies, Thermodynamics), (*Thermodynamics, Reviews), Statistical mechanics, Calorimeters, Condensation, Liquids, Manometers

An improvement was made upon the apparatus used for heat capacity measurements and the measurements were refined to the extent that they can now reasonably be expected to give data of the high order of precision required for crucial tests of theories. The bulk of the report is devoted to a description of the apparatus developed, the art involved in its operation, and the results obtained on two particular critical systems. An attempt was made to measure the partial vapor pressure and hence the fugacity of components in a liquid-liquid near-critical mixture as a function of composition.

**AD-625 579 Fld. 20/13, 11/6, 11/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**EQUATION OF STATE OF SOLIDS: ALUMINUM AND TEFLON.**
Final rept. 15 May 64-14 Jul 65,
by G. D. Anderson, D. G. Doran, and A. L. Fahrenbruch. Dec 65, 50p. Contract AF29 (601)-6409 Proj. AF-5710,SRI-GSU-5057 Task 15.018
WL TR-65-147
Unclassified report

Descriptors: (*Aluminum, Equations of state), (*Halocarbon plastics, Equations of state), (*Equations of state, Solids), Energy, Pressure, Volume

Pressure, volume, and energy equation of state data obtained using shock wave techniques are presented for aluminum and Teflon. Solid aluminum samples initially at room temperature or preheated to near melting, and porous aluminum samples at room temperature, were studied over a pressure range of 200 to 1200 kbar. It was found that the largest variations of volume and energy could be achieved using porous samples. Values of Gruneisen's ratio estimated from values of the thermal pressure and thermal energy range from 2.1 to 1.37. Due to the sensitivity of Gruneisen's ratio to the Hugoniot data, it is not possible to formulate its energy or volume dependence conclusively at the present time. Of greatest significance is the fact that it does not vary widely. Solid and porous Teflon samples were studied over a pressure range of 100 to 500 kbar. Hugoniot curves drawn on the basis of the ten data points obtained indicate a variation of Gruneisen's ratio from about 0.7 to 2.0. (Author)

**AD-624 972** See Fld. 7/4

**AD-624 973** See Fld. 7/4

**AD-624 974** See Fld. 7/4

**AD-624 984** See Fld. 20/4

**AD-625 066** See Fld. 4/1

**AD-625 082** See Fld. 20/9

**AD-625 083** See Fld. 14/2

**AD-625 244** See Fld. 21/5

**AD-625 253** See Fld. 14/2

**AD-625 265** See Fld. 10/1

**AD-625 486** See Fld. 20/3

## 20/14. WAVE PROPAGATION

**AD-624 991 Fld. 20/14**
**CFSTI Prices: HC $2.00 MF $0.50**
*STANFORD UNIV CALIF STANFORD ELECTRONICS LABS*
**EXPERIMENTAL INVESTIGATION OF THE COHERENCE DISTANCE OF THE ATMOSPHERE FOR MICROWAVES.**
Final rept. Jun 61-Jul 65,
by R. N. Bracewell. Aug 65, 32p. Rept. no. sel-65-083
Contract AF19 (604)-7249 Proj. AF-4600 Task 46017
AFCRL 65-285
Unclassified report

Descriptors: (*Scintillation, Radio waves), (*Radio waves, Scintillation), (*Extraterrestrial radio waves, Scintillation), (*Atmosphere, Radiofrequence interference), Microwaves, Phase distortion, Phase measurement, Radio interferometers, Parabolic antennas

An attempt has been made to measure the phase fluctuations of radio waves induced by the earth's atmosphere. The strong radio source Cygnus A was observed at a frequency of 3075 Mc/s using a two-element interferometer consisting of a two 30-foot diameter parabaloid antennas on equatorial mounts. The fringe pattern was recorded for periods of several hours, and the phase of each fringe, relative to a theoretical fringe pattern, was obtained. The fluctuation in the phase values shows an rms variation of one to three times the value expected from the system noise. It is not clear whether this excess fluctuation is attributable to the atmosphere, or whether it is a measure of the limiting phase stability of the instrument. The measurements do, however, provide an upper limit to the fluctuation in the effective angle of arrival of the radio waves, which is less than one second of arc for elevation angles greater than 30 deg. A description is also given of the antennas, the equatorial mounts, and the control units developed for the traveling-wave preamplifiers. (Author)

**AD-625 084 Fld. 20/14, 20/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**THE PROPAGATION PATH OF A WAVE IN A VARIABLE SPEED OF SOUND MEDIUM OBTAINED BY EMPLOYING FERMAT'S PRINCIPLE,**
by Louis Solomon. Nov 65, 22p. Rept. no. 65-48
Contract Nonr-233 (62)
Unclassified report

Descriptors: (*Sound, Propagation), Velocity, Integrals, Functional analysis

Fermat's Principle states that a wave will follow a path such that the time taken to move between two points is a minimum. According to this principle, the ray path of a sound wave in a variable speed of sound medium is derived using variational techniques. This leads to an integral which gives the horizontal position of the wave front explicitly as a function of the speed of sound variation with vertical distance. Several examples are worked out, including an explanation of the occurrence of sound channels and shadow zones. Further, it is shown that a hyperbolic cosine function closely approximates the actual velocity of sound as a function of depth. Using the hyperbolic cosine approximation, the integral is evaluated giving an explicit formula for a ray path. (Author)

**AD-625 088 Fld. 20/14, 20/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**A BRIEF COMMENT ON THE HYDRAULIC ANALOGY OF AN ACOUSTIC WAVE IN A PIPE,**
by L. Solomon, and D. E. Cuadra. Nov 65, 25p. Rept. no. 65-45
Contract Nonr-233 (62)
Unclassified report

Descriptors: (*Pipes, Acoustics), (*Acoustics, Propagation), Hydraulic systems, Water, Flow visualization

The analogy between small amplitude wave propagation in shallow water and acoustic wave propagation in a uniform medium is discussed. A simplified first order theory is derived, based upon space-time techniques, in order to predict the magnitudes of the transmitted and reflected waves arising due to the incident wave encountering a small area change. Theoretical calculations agree favorably with experimental results. Photographs obtained from motion pictures of the unsteady phenomena are also presented. (Author)

**AD-625 122 Fld. 20/14, 9/5**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB*
**THE CONTROL OF ELECTROMAGNETIC SCATTERING BY IMPEDANCE LOADING.**
Physical sciences research papers,
by J. K. Schlinder, R. B. Mack, and P. Blacksmith, Jr., Nov 65, 22p. Rept. no. psrp-159
Proj. AF-5635 Task 563502
AFCRL 65-808
Unclassified report

*Availability: Published in the Proceedings of the IEEE, v53 n8 p993-1004 Aug 1965. Copies to DDC users only.*

Descriptors: (*Electromagnetic wave reflections, Control), (*Antennas, Electrical impedance), Scattering Backscattering, Antenna radiation patterns, Dipole antennas, Microwave equipment

Electromagnetic scattering from a conducting object can be controlled by loading portions of its surface with distributed or lumped impedances. The scattered field from a loaded object is expressed as a superposition of fields scattered by the unloaded object and fields reradiated by the loading. The interference of these fields can be used to produce the required scatter control. Techniques for evaluating the reradiated field are discussed. A general form for the scattered field as a function of load impedance is shown, and techniques for studying this form are discussed. Theoretical and experimental results for thin, impedance loaded dipoles are compared. For dipole lengths not much greater than lambda/2, broadside backscatter can be reduced 30 to 40 dB with a passive center load. Greater lengths and other aspects require multiple passive loads. Backscatter reduction of up to 20 dB has been reported for thick dipoles at broadside incidence, planar surfaces at normal incidence, and long thin objects near endon incidence. (Author)

**AD-625 128 Fld. 20/14, 20/6**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB*
**MICROWAVE MEASUREMENTS OF PARTIALLY COHERENT FIELDS.**
Physical sciences research papers,
by J. L. Poirier, W. Rotman, and R. A. Shore. 21 May 65, 16p. Rept. no. psrp-158
Proj. AF-4642 Task 464202
AFCRL 65-784
Unclassified report

*Availability: Published in Applied Optics v4 n10 p1321-8 Oct 1965. Copies to DDC users only.*

Descriptors: (*Microwaves, Diffraction), (*Diffraction, Microwaves), Microwave oscillators, Glow lamps, Antenna radiation patterns, Antenna apertures, Electromagnetic waves, Polarization, Radiofrequency generators

This paper describes a new technique for producing an extended incoherent microwave source and its use in generating calibrated partially coherent fields. The source consists of a planar array of commercial fluorescent lamps for which the thermal radiation corresponds to electron temperatures of over 10,000K. The technique is significant in that, heretofore, laboratory measurements of radiation from extended microwave sources have been restricted principally to coherent fields, even though many radio propagation studies involve partially coherent fields. Radiometric measurements were made of the coherence of the extended microwave source fields and found to agree well with the van Cittert-Zernike theorem. Diffraction patterns of circular apertures illuminated by partially coherent fields were also measured and showed similar good agreement with theory. (Author)

**AD-625 133 Fld. 20/14, 20/9**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB*
**ON TRANSIENT WAVE PROPAGATION IN A PLASMA.**
Physical sciences research papers: revised ed.,
by Carl T. Case. 7 May 65, 14p. Rept. no. psrp-141
Proj. AF-4642 Task 464202
AFCRL 65-702

Unclassified report

Revision of manuscript submitted 15 Apr 65.

*Availability: Published in Proceedings of the IEEE v53 n7 p730-1 Jul 1965. Copies to DDC users only.*

Descriptors: (*Plasma medium, Wave transmission), (*Wave transmission, Plasma medium), (*Electromagnetic waves, Plasma medium), Transients, Propagation, Wave functions, Plasma physics

Curves are presented for the transient wave propagation of an electromagnetic harmonic signal in an unbounded isotropic and lossless plasma for various conditions of propagation length and plasma frequency. Curves are also presented for the reflected signal from a semi-infinite plasma medium. (Author)

**AD-625 139 Fld. 20/14**
*CENTRAL RADIO PROPAGATION LAB BOULDER COLO*
**PROPAGATION OF PULSES IN DISPERSIVE MEDIA.**
Scientific rept.,
by James R. Wait. 8 Jul 65, 21p. Rept. no. crpl-500-11-1000422 ,SR-30
Contract PRO-65-504 Proj. AF-4600 Task 460004
AFCRL 65-435

Unclassified report

*Availability: Published in Radio Science Journal Research NBS/USNC-URSI v69D n11 p1387-1401 Nov 1965. Copies to DDC users only.*

Descriptors: (*Electromagnetic pulses, Propagation), (*Waveguides, Electromagnetic properties), Broadband, Distortion, Transients, Integral transforms, Numerical analysis

The paper deals with various approximate procedures for calculating the distortion of a pulse after it has propagated through a dispersive channel such as a waveguide. The methods used for evaluating the integrals utilize a stationary phase principle. Both impulsivetype and quasi-monochromatic sources are considered. It is shown that, in most cases, the transient response may be obtained straightforwardly from the shape of the phase vs. frequency characteristics of the system. Some attention is given to the complication which arises when the group velocity has an extremum as a function of frequency. (Author)

**AD-625 609 Fld. 20/14**
**CFSTI Prices: HC $7.15 MF $2.00**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB*
**A METHOD OF SOLVING THE INTEGRAL EQUATIONS FOR THE ERTICAL PROPAGATION OF TIME-HARMONIC ELECTROMAGNETIC PLANE WAVES IN ANISOTROPIC VERTICALLY-HOMOGENEOUS MEDIA,**
by John M. Tomlinson. 30 Dec 65, 413p. Rept. no. scientific-259
Contract AF19 (628)-4014 Grant ,NSF-GP-2914
Proj. AF-8605 Task 860502
AFCRL 65-872

Unclassified report

Descriptors: (*Electromagnetic waves, Propagation), (*Integral equations, Wave functions), (*Wave functions, Integral equations), Wave transmission, Mathematical models, Numerical analysis

The problem of formulating a rigorous mathematical description of electromagnetic wave propagation in anisotropic inhomogeneous media is dealt with in this work. This based on a full-wave treatment. The coupled integral equations for continuous-waves are developed and methods for their solution deduced utilizing a matrix technique. Application is made to an exactly known solution as a test of the method. (Author)

**AD-624 903 See Fld. 4/1**

**AD-625 016 See Fld. 9/5**

**AD-625 018 See Fld. 9/1**

**AD-625 074 See Fld. 18/3**

**AD-625 164 See Fld. 17/9**

**AD-625 261 See Fld. 9/5**

**AD-625 315 See Fld. 20/1**

**AD-625 349 See Fld. 4/1**

**AD-625 413 See Fld. 17/3**

**AD-625 471 See Fld. 20/12**

**AD-625 490 See Fld. 17/7**

## 21/2. COMBUSTION AND IGNITION

**AD-624 915 Fld. 21/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**BASES OF BURNER THEORY FOR LIQUID FUEL WITH GAS GENERATOR,**
by N. S. Lamekin. 24 Nov 65, 12p. Rept. no. ftd-TT-65-1034
TT 65-64822

Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Mashinostroenie (USSR) n11 p103-7 1960.

Descriptors: (*Combustion chambers, Theory), Fuels, Gas generators, USSR

**AD-625 015 Fld. 21/2, 21/9.1**
**CFSTI Prices: HC $3.00 MF $0.75**
*INSTITUTO NACIONAL DE TECHNICA AEROESPACIAL MADRID (SPAIN)*
**HETEROGENEOUS COMBUSTIONS AND FLAMES STRUCTURES.**
Final rept. 1 Apr 63-31 Mar 65,
by Carlos Sanchez Tarifa. 31 Mar 65, 61p. Contract AF-EOAR-44-63 AFOSR 65-1791

Unclassified report

Descriptors: (*Combustion, Liquid rocket fuels), (*Flame propagation, Diffusion), Flames, Reaction kinetics, Boundary value problems, Drops, Heat flux, Convection (Heat transfer), Laminar boundary layer, Oxygen, Hydrogen, Forest fires

Flame propagation along the surface of a liquid fuel is studied. The problem of heat exchange in the fuel is considered. Fundamental equations, boundary conditions, and experimental results are given. The structure of the hydrogen-oxygen diffusion flame with spherical symmetry is considered.

**AD-625 044 Fld. 21/2, 7/4, 21/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF*
**THERMODYNAMIC PROPERTIES OF PROPELLANT COMBUSTION PRODUCTS.**
Quarterly letter rept. no. 1, 1 Jun-31 Aug 65,
by N. D. Potter. 31 Aug 65, 8p. Rept. no. qlr-65-14
Contract AF49 (638)-1577 Proj. arpa order-317

Unclassified report

Descriptors: (*Combustion products, Thermodynamics), (*Propellants, Combustion products), (*Rocket propellants, Thermodynamics), Thermochemistry, Halides, Dissociation, Fluorides, Aluminum, Heat of sublimation, Mass spectroscopy

The objective of the program is to provide thermodynamic data for species which are potentially important combustion products of advanced chemical rockets and for species which are related to these. Enthalpy and entropy data are obtained from equilibrium measurements made by torsion-free evaporation and torsion-effusion techniques and by high temperature mass spectrometry.

**AD-625 059 Fld. 21/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**TOWARD A THEORY OF STABILITY OF POWDER COMBUSTION,**
by S. S. Novikov, and Yu. S. Ryazantsev. 17 Nov 65, 13p. Rept. no. ftd-TT-65-1114
TT 65-64843

Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n1 p57-61 1965.

Descriptors: (*Powders, Combustion), (*Combustion, Powders), Stability, Theory, Mathematical analysis, Reaction kinetics, Surface properties, Explosive materials, USSR

The method of small perturbations to study the stability of powder combustion with consideration of heat release in the surface of the condensation phase (k-phase), assuming that the combustion zone in the gas and the region of the chemical reaction in the k-phase immediately adjacent to the gasification surface are without inertia. A stability condition for powder combustion is derived for the two possible combustion regimes.

**AD-625 061 Fld. 21/2, 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**FLOW OF A NON-ADIABATIC SUPERSONIC FLOW OF AN IDEAL GAS AROUND A FLAT PLATE,**
by I. F. Shaknov. 8 Dec 65, 13p. Rept. no. ftd-TT-65-1122
TT 65-64845

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie, n4 p154-7 1964.

Descriptors: (*Supersonic flow, Combustion), (*Combustion, Supersonic flow), Heating, Fuels, Flat plate models, Kinetic theory, Gases, USSR

A discussion is given of the flow around a flat plate with a supersonic flow of an ideal gas in the presence of a heat generation zone connected with current lines and adjoining a surface of a plate. It is assumed that the rate of heat generation is proportional to the rate of fuel combustion calculated by the summary kinetic equation of certain power with a temperature dependence according to Arrhenius' Law. It is also assumed that in initial section the flow appears to be uniformly advancing and that the fuel in this section is uniformly mixed with air to the storcheometric ratio.

**AD-625 151 Fld. 21/2, 7/4, 19/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**THE TRANSIENT THEORY OF THERMAL SELF-IGNITION,**
by S. A. Kaganov. 17 Nov 65, 16p. Rept. no. ftd-TT-65-1018
TT 66-60012

Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki n1 p62-7 1965.

Descriptors: (*Autoignition, Chemical reactions), (*Reaction kinetics, Explosions), Detonations, Heat of reaction, Thermal properties, Concentration (Chemistry), USSR

A transient theory of thermal explosion is constructed, and the reaction rate and the spatial distribution of temperature in the reaction vessel are considered. The theory accounts for the change in concentration of the reacting substance throughout the reaction. The parameters characterizing the explosives are discussed.

**AD-625 582 Fld. 21/2, 7/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF*
**EMPIRICAL INFRARED ABSORPTION COEFFICIENTS OF H2O FROM 300K TO 3000K.**
Technical rept.,
by C. C. Ferriso, C. B. Ludwig, and A. L. Thomson. Dec 65, 62p. Rept. no. gd/c-DBE-65-028
Contract Nonr-3902 (00) ,ARPA Order-237 Proj. DEFENDER

Unclassified report

Descriptors: (*Water vapor, Absorption spectrum), (*Infrared radiation, Absorption), (*Exhaust gases, Optical properties), Rocket motors, Infrared spectroscopy, High-temperature research, Molecular rotation, Vibration, Band spectrum, Integrals

A set of absorption coefficients for water vapor as functions of temperature has been empirically deduced from existing quantitative absorption and emission spectra between 1 and 22 microns. The basic assumption was made that, for optically thick gases, the curve of growth is given by a statistical model. The absorption coefficients were obtained for each vibration-rotation band by adjusting the band averaged line half widths and line spacings such that the integral of the absorption coefficients was equal to the known integrated intensity of the particular band at a given temperature. The effect of foreign gas broadening and non-resonant water molecule broadening was included. The present results are compared with independent theoretical and experimental results and the agreement is satisfactory. (Author)

**AD-624 944 See Fld. 21/9**

**AD-625 008 See Fld. 7/4**

**AD-625 158 See Fld. 19/4**

**AD-625 326 See Fld. 19/4**

**AD-625 340 See Fld. 5/1**

**AD-625 489 See Fld. 19/4**

**AD-625 499 See Fld. 21/8**

**AD-625 598 See Fld. 21/9**

## 21/3. ELECTRIC PROPULSION

**AD-625 142 Fld. 21/3, 21/6, 22/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**GRANDIOSE ARE THE ACHIEVEMENTS OF SCIENCE,**
by . G. Chernyi. 3 Dec 65, 6p. Rept. no. ftd-TT-65-1048
TT 66-60003

Unclassified report

Unedited rough draft trans. from Krasnaya Zvezda (USSR) 11 Apr p2 1965.

Descriptors: (*Electric propulsion, Spacecraft), Astronautics, Nuclear propulsion, Upper atmosphere, Fuels, Processing, Refueling in flight, USSR

## 21/4. FUELS

**AD-625 143 Fld. 21/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**INSOLUBLE RESIDUES, FORMING DURING THE HEATING OF JET FUELS,**
by G. F. Bolshakov. 3 Dec 65, 8p. Rept. no. ftd-TT-65-1064
TT 66-60004

Unclassified report

Unedited rough draft trans. of Khimiya i Tekhnologiya Topliv i Masel (USSR) v8 n5 p55-7 1963.

Descriptors: (*Jet engine fuels, Impurities), Metals, Catalysis, Chemical precipitation, Oxidation, Corrosion, Copper alloys, Aluminum alloys, Steel, Heterocyclic compounds, USSR

The purpose of the work was to investigate the composition of insoluble residues, forming during the heating of jet fuels in contact with metals. The following fuels were studied: No. 1 TS-1 fuel, hydrogenated, with a total sulfur content of 0.011%; No. 2-TS-1 fuel, commercial, with total sulfur content of 0.16%, mercaptan content 0.007%; 3-TS-1 fuel, commercial, with total sulfur content of 0.065%, mercaptan content-0.003%. Copper alloys (bronze and brass) accelerate the autooxidation processes of fuels, promoting the formation of deposits on the metal, and increase the corrosion activity of the fuels. Duralumin D1T and especially steel 12KHN3A produce a much lesser effect on heated fuel, than bronze and brass. Metals not only catalytically accelerate residue formation, but they themselves actively participate in these processes. Removal of ashes and other elements from the fuel composition would lead to a slowing down of residue formation processes in fuels. (Extracted)

**AD-625 185 Fld. 21/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF DETERMINING THE FUEL COMPONENTS IN GASEOUS MIXTURES,**
by M. V. Rak. 30 Nov 65, 5p. Rept. no. ftd-TT-65-1157
TT 66-60029

Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 532, appl. no. 834366/26-25, 3 May 63.

Descriptors: (*Fuels, Gas analysis), (*Gas analysis, Test methods), Fuels, Combustion products, Mixtures, Electrical bridges, Mointors, Patents, USSR

A method of determining the combustible components of gaseous mixtures with the use of a thermochemical pickup is presented. To eliminate the influence of noncombustible components in the combustible components is determined by measuring the speed of the change in the signal of the pickup. This may be accomplished with a electrical bridge by means of the differentiation of the signal with the aid, for example of an RC filter.

**AD-625 246 Fld. 21/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ADDITIVE TO SULFUROUS FUELS FOR HIGH-SPEED DIESEL ENGINES,**
by N. A. Butkov, P. A. Sukhorukov, E. A. Kazmina, P. P. Botkin, and V. S. Yamburenko. 8 Dec 65, 5p. Rept. no. ftd-TT-65-1125
TT 66-60052

Unclassified report

Unedited rough draft trans. of Patent (USSR) 155 359, appl. no. 783879/24-6, 22 Jun 62.

Descriptors: (*Fuel oil, Fuel additives), (*Fuel additives, Barium compounds), (*Barium compounds, Fuel additives), Cycloalkanes, Salts, Diesel engines, Corrosion inhibition, Wear resistance, Organic sulfur compounds, Antioxidants, Patents, USSR

The object of the invention is an additive to sulfurous fuels for high-speed Diesel engines, which has the distinguished feature that, for the purpose of lowering the scale formation and wear of the engines, as an additional active component barium naphthenate is introduced in the amount of 0.6% with a corresponding lowering in the content of deparaffined heavy gas oil from 91% to 90.4%.

**AD-625 247 Fld. 21/4, 21/9.1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF IMPROVING THE THERMO-OXIDATION STABILITY OF HYDROCARBON FUELS,**
by F. Yu. Rachinskii, Yu. A. Bruk, and G. F. Bolshakov. 8 Dec 65, 6p. Rept. no. ftd-TT-65-1127
TT 66-60053

Unclassified report

Unedited rough draft trans. of Patent (USSR) 159 591, appl. no. 805093/23-4, 29 Nov 62.

Descriptors: (*Hydrocarbons, Stabilization), (*Jet engine fuels, Fuel additives), (*Rocket fuels, Fuel additives), (*Fuel additives, Thiols), Antioxidants, Organic sulfur compounds, Patents, USSR

The object of the invention is a method of improving the thermooxidation stability of hydrocarbon fuels by means of the addition of other substances which has the distinguishing feature that, for the additives, there used derivatives of mercaptan. (Author)

**AD-625 248 Fld. 21/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**ADDITIVE TO SULFUROUS FUEL,**
by M. I. Shapovalov. 8 Dec 65, 5p. Rept. no. ftd-TT-65-1126
TT 66-60054

Unclassified report

Unedited rough draft trans. of Patent (USSR) 157 034, appl. no. 755907/23-5, 15 Dec 61.

Descriptors: (*Fuel additives, Preparation), Propanols, Nitrobenzenes, Organic phosphorus compounds, Chromium compounds, Phosphates, Antioxidants, Pistons, Wear resistance, Patents, USSR

The object of the invention is an additive to sulfurous fuel on the basis of tricresylphosphate and nitrobenzene which has the distinguishing feature that, for the purpose of reducing the wear on the piston cylinders and lessening the scale formation, there are introduced isopropyl spirits and chromium nitrate. (Author)

**AD-625 407 Fld. 21/4, 1/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*RAND CORP SANTA MONICA CALIF*
**THERMAL PROTECTION FOR LIQUID-HYDROGEN FUEL TANKS IN HIGH-SPEED, LONG-RANGE AIRCRAFT,**
by W. D. Gosch. Oct 65, 66p. Rept. no. rm-4286-PR
Contract AF49 (638)-700 Proj. RAND
Unclassified report

Descriptors: (*Jet engine fuels, Cryogenics), (*Fuel tanks, Hypersonic planes), (*Liquified gases, Jet engine fuels), (*Thermal insulation, Fuel tanks), Hydrogen, Feasibility studies, Weight, Design, Thermal conductivity

Part of a continuing study of cryogenic-fuel systems is presented. An analysis is presented of requirements for thermal protection systems and of fuel boil-off for liquid-hydrogen tanks aboard hypersonic, long-range aircraft. From this analysis it should be possible to obtain preliminary approximations of the weights of fuel boil-off and thermal protection systems over a wide spectrum of tank sizes and heat inputs. (Author)

**AD-625 612** **See Fld. 7/3**

## 21/5. JET AND GAS TURBINE ENGINES

**AD-625 001 Fld. 21/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**CLOSED-CYCLE GAS-TURBINE INSTALLATION,**
by I. M. Kovtun, A. N. Naumov, and S. L. Kosmatov. 30 Nov 65, 5p. Rept. no. ftd-TT-65-1141
TT 65-64832
Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 202, pub. 9 Mar 63, appl. no. 824084/24-6.

Descriptors: (*Gas turbines, Theory), Gases, USSR

**AD-625 144 Fld. 21/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**REMOTE STARTING DEVICES FOR GAS TURBINES,**
by V. L. Borodkin, K. B. Sarantsev, and S. Z. Shabashov. 15 Nov 65, 7p. Rept. no. ftd-TT-65-1014
TT 66-60005
Unclassified report

Unedited rough draft trans. of Patent (USSR) 166 556, appl. no. 866641/24-6, 21 Nov 63.

Descriptors: (*Gas turbines, Engine starters), (*Engine starters, Gas turbines), Valves, Patents, USSR

The invention includes a regulator for the feed valve, and end cutoff for the servomotor, and a slide valve.

**AD-625 149 Fld. 21/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**CHARACTERISTICS OF MICROCONTAMINATIONS IN AVERAGE DISTILLATE FUELS,**
by Ya. B. Chertkov, and V. N. Zrelov. 17 Nov 65, 16p. Rept. no. ftd-TT-65-1020
TT 66-60010
Unclassified report

Unedited rough draft trans. of Khimiya i Tekhnologiya Topliv i Masel (USSR) v7 n10 p56-9 1962.

Descriptors: (*Fuel contamination, Gas turbines), (*Jet engine fuels, Contamination), Fuel systems, Turbojet engines, Particle size, Purification, Filters (Fluid), Fuel oil, Storage, Moisture, Tar, Combustion products, Organic compounds, Corrosion, Friction, Dust, USSR

Microcontaminations in fuels are formed as a result of the physico-chemical reaction of compounds with ashy elements, high-molecular tarry compounds and moisture. Compounds with ashy elements fall into the fuel as a result of corrosion of the apparatus and transportation media, wear of friction component mechanisms, the carrying in of dust from the air, and the washing out of certain fillers of plastic materials. Formation of much larger contamination particles takes place basically on account of enlargement of small particles characteristic of high dispersion systems. Under the effect of temperature, of mixing, of excessive pressure and other factors, formation of particles with the dimension of 0.1 to 1 microns and their further packing increases sharply. To prevent or limit fuel contamination and to permit proper exploitation of fuel economy, it is advisable to make systematic removal of moisture from the fuel, and to prevent the formation of high molecular tar particles and penetration into the fuel of compounds with 'ashy' elements. (Author)

**AD-625 182 Fld. 21/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**DIMENSIONLESS CHARACTERISTICS OF GAS TURBINE UNITS WITH SLITTED SHAFTS,**
by V. A. Robova, and Tu Reng-yung. 26 Oct 65, 16p. Rept. no. ftd-TT-65-671
TT 66-60026
Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v9 n8 p14-7 1963. This trans. supersedes TT-65-62592.

Descriptors: (*Gas turbines, Operation), Mathematical analysis, Compressors, USSR, Shafts

Results of designing a gas turbine unit with a slitted shaft at a variable regime and in relative units are presented. (Author)

**AD-625 194 Fld. 21/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EXPERIMENTAL STUDY OF A MODEL CONTROL BLEEDER STAGE WITH A ROTATING DIAPHRAGM,**
by M. E. Deich, and A. G. Sheinkman. 26 Oct 65, 15p. Rept. no. ftd-TT-65-669
TT 66-60033
Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v11 n2 p14-7 1965. This trans. supersedes TT-65-62593 dated 2 Jul 65.

Descriptors: (*Bleed systems, Steam turbines), (*Steam turbines, Bleed systems), Rotation, Control systems, Diaphragms (Mechanics), USSR, Valves, Models (Simulations), Operation

The results of study of a model control bleeder stage with rotating diaphragm are presented, the efficiency of the stage is compared to a stage with a throttle valve, and also formulas are given for the determination of response. (Author)

**AD-625 242 Fld. 21/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**THERMAL RESISTANCE OF TAIL CONNECTIONS OF TURBINE BLADES,**
by O. T. Ilchenko, and V. M. Kapinos. 30 Nov 65, 17p. Rept. no. ftd-TT-65-680
TT 66-60048
Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v5, n6, p23-6, 1959.

Descriptors: (*Turbine blades, Thermal properties), Gas turbine blades, Steam turbine blades, Heat transfer, USSR, Mathematical analysis

The report discusses a calculated determination of thermal resistance of tail sections of Laval's Y-shaped, arborescent type turbine blade.

**AD-625 244 Fld. 21/5, 20/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**THE PROBLEM OF SELECTING OPTIMUM PARAMETERS OF A DOUBLE CASCADE GAS TURBINE ENGINE,**
by A. M. Topunov, and B. A. Tikhomirov. 8 Dec 65, 21p. Rept. no. ftd-TT-65-1656
TT 66-60050
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Aviatsionnaya Tekhnika (USSR) n3 p108-18 1965.

Descriptors: (*Gas turbines, Optimization), Turbine parts, Cascade structures, Thermodynamics, Mechanical engineering, USSR

Equations are obtained to evaluate the effect of determining parameters of cycle and stage on the strength working conditions and radial baliding dimensions of blading turbines of two cascade gas turbine engines (GID). Results are given of calculations showing the intensity of the effect of determining parameters on strength working conditions and radial blading dimensions of turbo compressors (TVD). Basic laws are revealed of TVD stage parameter relationship and parameters of the cycle of a double cascade GTD at constancy conditions of the maximum of long lasting strength of blades. Also discussed is the evaluated intensity of the effect of determinant cycle parameters and TVD on the economy of a two stage (two cascade) GTD at reserve constancy condition with respect to the maximum of long lasting strength of the blades.

**AD-625 290 Fld. 21/5, 11/6, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EXPERIMENT IN THE USE OF EI 893 ALLOY FOR GAS-TURBINE BLADES,**
by L. B. Getsov, V. Shovkun, and M. A. Filatova. 17 Nov 65, 13p. Rept. no. ftd-TT-65-1025
TT 66-60068
Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v11 n2 p30-2 1965.

Descriptors: (*Gas turbine blades, Heat-resistant metals + alloys), (*Heat-resistant metals + alloys, Gas turbine blades), USSR, Aging (Materials), Mechanical properties, Microstructure, Fatigue (Mechanics), Temperature, Mechanical working, Heat treatment

## 21/6. NUCLEAR PROPULSION

**AD-625 142 See Fld. 21/3**

## 21/7. RECIPROCATING ENGINES

**AD-624 910 Fld. 21/7, 11/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**EFFECT OF OIL OXIDATION ON THE PROCESS OF RUNNING-IN A RING-SOCKET PAIR IN AN INTERNAL COMBUSTION ENGINE,**
by S. V. Ventsel, M. M. Chupis, and V. O. Lelyuk. 26 Nov 65, 11p. Rept. no. ftd-TT-65-1039
TT 65-64817
Unclassified report

Unedited rough draft trans. of Akademiya Nauk URSR, Kiev. Dopovidi, n4 p499-501 1964.

Descriptors: (*Internal combustion engines, Operation), (*Oils, Oxidation), Wear resistance, Aging (Materials), Rings, USSR, Metals, Friction, Pistons, Polymerization, Lubricants

A typical scheme of the running-in process was obtained on an experimental set-up simulating the work of a ring in a socket. It was found that stabilization of the temperature and the work of friction does not characterize the end of the running-in process, but the formation in the oil of oxidation processes and oxidative polymerization. The phenomenon of 'apparent' repeated running-in was observed on replacing the worked oil by fresh oil. The results furnish grounds for revising plant conditions of running-in. (Author)

## 21/8. ROCKET MOTORS AND ENGINES

**AD-625 499 Fld. 21/8, 19/4, 21/2, 10/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*SHEFFIELD UNIV (ENGLAND) DEPT OF FUEL TECHNOLOGY AND CHEMICAL ENGINEERING*
**INTENTIONAL COMBUSTION OSCILLATIONS IN PROPULSION SYSTEMS.**
Final scientific rept.,
by D. Harris, and J. Swithenbank. 25 Jan 65, 24p. Rept. no. hic-54
Contract AF-EOAR-101-63 AFOSR 65-1804
Unclassified report

See also AD-608 206.

Descriptors: (*Combustion, Oscillation), (*Magnetohydrodynamics, Electric power production), Combustion chambers, Rocket motors, Magnetohydrodynamic generators, Stability, Great Britain, Propulsion

Magnetohydrodynamic (MHD) power generation has been shown theoretically to be attractive when the amplitude of oscillation is 50% or greater. The mean conductivity is increased by approximately one and a half times. To substantiate this theoretical analysis an experimental rig was designed and constructed. This comprises of a gaseous (Hydrogen-Air) rocket motor where the air is introduced tangentially and the fuel is introduced either longitudinally or tangentially. Combustion oscillations were produced.

**AD-625 030 See Fld. 11/5**

**AD-625 220 See Fld. 21/9**

**AD-625 395 See Fld. 22/2**

## 21/8.1 LIQUID ROCKET MOTORS

**AD-625 298 Fld. 21/8.1**
**CFSTI Prices: HC $2.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**LOW FREQUENCY INSTABILITY OF THE NOMINAL REGIME OF A LIQUID ROCKET ENGINE,**
by K. S. Kolesnikov. 14 Dec 65, 33p. Rept. no. ftd-TT-65-1772
TT 66-60076
Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Teknicheskoi Fiziki (USSR) n2 p119-30 1965.

Descriptors: (*Rocket motors (Liquid propellant), Stability), Low frequency, USSR, Models (Simulations), Solid rocket fuels, Combustion products, Mathematical analysis

## 21/8.2 SOLID ROCKET MOTORS

**AD-625 219 See Fld. 20/11**

## 21/9. ROCKET PROPELLANTS

**AD-624 944 Fld. 21/9, 21/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*ROCKETDYNE CANOGA PARK CALIF*
**RESPONSE OF A BURNING SOLID PROPELLANT TO PRESSURE WAVES OF FINITE AMPLITUDE.**
Technical rept.,
by A. L. Huebner, and T. A. Coultas. Jun 65, 79p. Rept. no. r-6213
Contract AF49 (638)-1208 AFOSR 65-1733
Unclassified report

Descriptors: (*Solid rocket propellants, Combustion), (*Combustion, Pressure), Aluminum, Powder metals, Fuel additives, Shock tubes, Test methods, Burning rate, Acoustics

Shock-tube techniques were utilized to determine the response of a burning solid propellant surface to pressure perturbations of small, but finite amplitudes. This method of obtaining propellant responses is described with emphasis upon the techniques which were developed to remove undesirable temperature gradients. Other experimental techniques utilized to obtain high-frequency response pressure measurements under reproducible pressure, flow, and temperature conditions are described. The propellants include those (both aluminized and nonaluminized) with a wide range of pressure exponents as well as absolute burning rate. All of these experiments were conducted at about 400 psia ambient pressure. A discussion of the treatment of the experimental data to obtain Fourier transforms and the propellant response as a function of frequency is presented, with particular emphasis upon the significance and reproducibility of the data. (Author)

**AD-625 220 Fld. 21/9, 21/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*CATHOLIC UNIV OF AMERICA WASHINGTON D C STRESS ANALYSIS LABS*
**AN EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE. STRESSES IN SQUARE SLABS, WITH DIFFERENT EDGE GEOMETRIES, WHEN BONDED ON ONE FACE TO A RIGID PLATE AND SHRUNK.**
Progress rept. no. 5,
by A. J. Durelli, V. J. Parks, and C. J. del Rio. Dec 65, 17p. Contract AF04 (611)-10378 Proj. CUA-4.142.02
Unclassified report

See also AD-620 692.

Descriptors: (*Rocket propellant grains, Stresses), (*Rocket cases, Stresses), Epoxy plastics, Photoelasticity, Geometric forms, Mathematical analysis

An approximately square epoxy slab (approx. 14 in x approx. 14 in x 1 in) with four different edge geometries was bonded to a rigid plate on one of its faces. In the process of 'freezing' photoelastic effects a state of restrained shrinkage developed. Slices removed from the slab were used to determine the concentration factors corresponding to the four geometries. (Author)

**AD-625 598 Fld. 21/9, 21/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*ROCKET POWER INC PASADENA CALIF RESEARCH LABS*
**THERMODYNAMIC PROPERTIES OF ROCKET EXHAUST PRODUCTS.**
Quarterly rept. no. 1, 1 Aug-31 Oct 65,
by M. A. Greenbaum, R. E. Yates, M. A. Frisch, H. C. Ko, and M. Farber. 31 Oct 65, 25p. Contract AF04 (611)-10929
Unclassified report

Descriptors: (*Rocket propellants, Combustion products), (*Exhaust gases, Thermochemistry), (*Thermodynamics, Rocket propellants), (*Boron compounds, Hydroxides), (*Beryllium compounds, Hydroxides), (*Aluminum compounds, Hydroxides), Rocket motors (Hybrid propellant), Rocket motors (Solid propellant), Entropy, Additives, High-temperature research

Experiments are to be performed on thermodynamic and physical properties of some of the compounds of light metals likely to be formed by the combustion of solid or hybrid propellants and their additives at temperatures of 2000 to 5000K. The thermodynamic properties are to be determined for gaseous BeOH, BOH, and AlCl2, and the entropy of Be (OH)2 is to be determined. Apparatus was assembled and constructed for these experiments.

**AD-624 928 See Fld. 7/2**

**AD-625 044 See Fld. 21/2**

**AD-625 077 See Fld. 7/2**

## 21/9.1 LIQUID ROCKET PROPELLANTS

**AD-625 015 See Fld. 21/2**

**AD-625 175 See Fld. 7/4**

**AD-625 247 See Fld. 21/4**

## 22/1. ASTRONAUTICS

**AD-624 982 See Fld. 22/3**

**AD-625 142 See Fld. 21/3**

**AD-625 300 See Fld. 22/2**

**AD-625 350 See Fld. 13/6**

**AD-625 393 See Fld. 8/7**

## 22/2. SPACECRAFT

**AD-625 300 Fld. 22/2, 22/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**FIVE YEARS OF SOVIET SPACE INVESTIGATION,**

by M. G. Kroshkin, and V. G. Samarin. 25 Oct 65, 23p. Rept. no. ftd-MT-65-64
TT 66-60077

Unclassified report

Edited machine trans. of Geofizicheskii Byulleten (USSR) n13 p80-93 1963.

Descriptors: (*Space flight, USSR), (*Scientific satellites, USSR), Astronautics, Satellites (Artificial), Upper atmosphere, Ionosphere, Space environmental conditions, Space flight, Astronauts, Terrestrial magnetism, Cosmic rays, Solar radiation, Meteors, Radiation hazards, Wave propagation, Bibliographies

This survey is a short reference of the basic stages of space investigations carried out in the Soviet Union during the five years (1958-1962) of the space era. Data are given on all Soviet spacecraft launched in 1957-1962. (Author)

**AD-625 395 Fld. 22/2, 21/8**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**MINIMUM FUEL TRAJECTORIES FOR THRUST LIMITED ROCKETS IN AN ADVERSE SQUARE GRAVITY FIELD.**
Masters' thesis,
by Kenneth E. Needham. Aug 65, 64p. Rept. no. ga/mech/65-38

Unclassified report

Descriptors: (*Fuel consumption, Rockets), (*Lunar surface vehicles, Fuel consumption), Optimization, Soft landings, Gravity, Thrust [illegible]or control systems, Boundary value prob-

Minimum fuel trajectories for motion of a rocket in an inverse square gravity field are analyzed. The equations of motion are derived and expressed in terms of non-dimensional parameters making the equations applicable to any inverse square force field. The necessary condition for a minimum fuel path is obtained by using Pontryagin's Maximum Principle. Using a trial and error method of solution the optimal control of thrust direction and magnitude is determined and the results are presented as functions of range for three initial thrust to weight ratios. Ranges of 2 to 65 miles on the surface of the moon for initial thrust to weight ratios of approximately 1.6, 1.9, and 2.4 are considered. The solutions obtained are compared with solutions for minimum fuel trajectories in a uniform parallel gravity field. (Author)

**AD-625 442 Fld. 22/2, 11/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**THE EFFECTS OF EXTREME ULTRAVIOLET RADIATION ON THE REFLECTANCE OF THERMAL CONTROL SURFACE COATINGS.**
Master's thesis,
by James McMahon Cowie. Aug 65, 66p. Rept. no. gsf/mech/65-32

Unclassified report

Descriptors: (*Temperature control, Spacecraft), (*Coatings, Temperature control), (*Degradation, Coatings), Ultraviolet radiation, Solar radiation, Reflectivity, Vacuum, Aluminum coatings, Plastic coatings, Acetal plastics, Polyester plastics

The effects of ultraviolet radiation in the 500A to 2,000A wavelength region on the spectral reflectance and integrated solar absorptance of three thermal control surface coatings were investigated. The coatings investigated were polished 99.99+% aluminum, and silicone alkyd and melamine modified polyvinyl butyral pigmented 60% by volume with titanium dioxide ($TiO_2$). Samples of the coatings were exposed for 96 hours in 0.000001 Torr vacuo to radiation from a capillary discharge of hydrogen gas. The spectral reflectance in the 4,000A to 7,000A and 20,000A to 150,000A regions was determined before and after the 96 hour exposure periods. It was found that the maximum decrease in spectral reflectance occurred between 4,200A and 4,600A and was equal to 0.10 for the silicone alkyd/$TiO_2$, 0.07 for the melamine modified polyvinyl butyral/$TiO_2$, and 0.06 for the polished aluminum. The integrated solar absorptance was calculated before and after the exposure periods. It was found that the integrated solar absorptance changed from 0.196 to 0.219 for the silicone alkyd/$TiO_2$, from 0.232 to 0.248 for the melamine modified polyvinyl butyral/$TiO_2$, and from 0.27 to 0.30 for the polished aluminum. (Author)

**AD-624 936** **See Fld. 9/6**

**AD-625 258** **See Fld. 8/4**

**AD-625 340** **See Fld. 5/1**

**AD-625 351** **See Fld. 5/3**

**AD-625 380** **See Fld. 17/5**

**AD-625 388** **See Fld. 4/2**

**AD-625 481** **See Fld. 4/2**

## 22/3. SPACECRAFT TRAJECTORIES AND REENTRY

**AD-624 982 Fld. 22/3, 22/1, 17/7**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS*
**AN OPTIMAL DISCRETE CONTROL STRATEGY FOR INTER-PLANETARY GUIDANCE.**
Revised ed.,
by Frank Tung. 29 Mar 65, 8p. Contract NAS1-3777

Unclassified report

Revision of manuscript submitted 18 Sep 64.

*Availability: Published in IEEE Transactions on Automatic Control Vac10 N3 P328-35 Jul 1965. Copies to DDC users only.*

Descriptors: (*Interplanetary trajectories, Guidance), (*Guidance, Interplanetary trajectories), (*Space flight, Interplanetary trajectories), Space probes, Optimization, Dynamic programming, Linear systems, Astronautics

The problem of guiding one state of a linear dynamical system to a prescribed rms terminal accuracy in the presence of injection, measurement, as well as enginemechanization errors with a minimum average effort, is considered. Orbit corrections are assumed to be mechanized in the form of discrete velocity increments whose areas are proportional to the predicted miss distance. Equations are derived for computing the feedback gains as a function of the correction times. It is then shown how the spacings between successive corrections can be optimized. This is done by outlining a computation procedure based on the theory of dynamic programming. The optimum solution includes the effect of the loss of information caused by the mechanization error. The results are applied to a simple but illustrative example that approximates the terminal phase of an interplanetary trip. A numerical study is made relating the number of corrections and the required amount of propellant for various terminal accuracies and mechanization errors with typical initial errors. (Author)

**AD-625 394 Fld. 22/3, 22/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**AN INVESTIGATION OF THE EFFECT OF LAUNCH SITE LOCATION AND VARIATION OF LAUNCH PARAMETERS ON LUNAR-EARTH TRAJECTORIES.**
Masters' thesis,
by Paul Stuart Skartvedt. Aug 65, 97p. Rept. no. ga/mech/65-41

Unclassified report

Descriptors: (*Interplanetary trajectories, N-body problem), (*Celestial mechanics, Interplanetary trajectories), (*Atmospheric entry, Interplanetary trajectories), (*Launching, Lunar bases), Equations of motion, Programming (Computers), Integration

Lunar-earth trajectories are examined to determine the sensitivities of earth re-entry angle and velocity to changes in both static and dynamic lunar launch parameters. These trajectories are classified as free return single pass trajectories with no guidance or delta capability considered. The equations of motion for the trajectories are derived from the restricted problem of three bodies in a rotating coordinate system. The earth and moon are considered to rotate about their barycenter in a circular orbit at a constant rate of rotation. The equations of motion do not permit closed form solutions and are programmed for solution on the IBM 7094 Digital Computer in Fortran IV language using Runge-Kutta-Gill numerical integration methods. Two lunar longitude launch locations with five latitude locations for each longitude were investigated. At each location launch angles and velocities were introduced which would result in an earth re-entry angle of approximately five degrees with the local horizontal. For these initial conditions, sensitivities to change of launch velocity, launch azimuth angle and launch elevation were determined. The results showed that an increase in launch velocity caused an increase in all sensitivity coefficients; that re-entry angle was most sensitive to change in launch azimuth angle, and that re-entry velocity is solely a function of launch velocity. (Author)

**AD-625 453 Fld. 22/3, 12/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*MARTIN CO BALTIMORE MD*
**ORBIT DETERMINATION AND ANALYSIS BY THE MINIMUM VARIANCE METHOD.**
Rept. for Jun 64-May 65,
by Karlis Minka. Aug 65, 89p. Rept. no. scientific-1 ,ER-13950
Contract AF 19 (628)-4167 AFCRL 65-579

Unclassified report

Descriptors: (*Orbital trajectories, Analysis of variance), (*Analysis of variance, Orbital trajectories), Equations of motion, Mathematical models, Matrix algebra, Geophysics, Solar radiation

The aspects of accurate determination of Earth satellite orbits by the Minimum Variance Method are presented. In addition, techniques for the determination of the associated physical constants, such as the coefficients in the Earth's gravitational potential, exospheric temperature, etc., are developed. A method for determination of the state transition matrix is presented. Also included are a review of the time systems employed in satellite orbit determination and a short discussion of the types of observations. The mathematical model of the dynamical system includes nine zonal harmonics and up to the fourth order tesseral harmonics of the Earth's gravitational potential. Atmospheric drag effects are included on the assumption that the atmosphere rotates with the angular velocity of the Earth. First order solar and lunar gravitational attractions and solar radiation pressure are also treated. The satellite orbits are integrated in a reference system which considers the precession and nutation of the Earth. Rectangular coordinate systems are used throughout the development. (Author)

**AD-625 373** **See Fld. 3/3**

## 22/4. SPACECRAFT LAUNCH VEHICLES AND GROUND SUPPORT

**AD-625 352** **See Fld. 16/1**

**AD-625 394** **See Fld. 22/3**

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

## SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and field/group. A typical subject index entry is shown below.

*ALUMINUM
GLASS TEXTILES
INVESTIGATION OF GLASS-
METAL COMPOSITE MATERIALS
AD-619 773 FLD. 11/7

## PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Field/group and titles are also listed. Three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*CHASE, JOHN W.
* * *
THE LANTHANUM, EUROPIUM,
AND DYSPROSIUM CONTENTS OF
TWO TEKTITES
AD-619 828 FLD. 8/7
* * *
A PROCEDURE FOR GEOCHEMICAL
INTERPRETATION OF TERRESTRIAL
RARE-EARTH ABUNDANCE PATTERNS
AD-619 834 FLD. 8/7

## CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry for each document are listed the originator of the report, the originator's report number, the title, AD number, and field/group. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parenthesis directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

799-857 O - 66 - 8

*AEROJET- GENERAL CORP AZUSA
CALIF

* * *

TR3015
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
(AFOSR 65-1058)
AD-619 513 FLD. 7/4

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C

* * *

65-1058
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
AD-619 513 FLD. 7/4

## CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and field/group.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
(ESD TDR-65-315)
AD-619 580 FLD. 9/5
(ESD TDR-65-309)
AD-619 708 FLD. 3/1

## REPORT NUMBER INDEX

The Report Number Index lists identifying numbers assigned either by the document originators or by the sponsors of the work described in the documents. The AD number and Field/Group location in TAB are given for each report number. If both the originator and the sponsor of a document have assigned identifying numbers, listings for both will appear in the respective alphanumeric positions.

In certain cases accession numbers are also given with the corresponding AD numbers and TAB locations; for instance, the IDEP (Interservice Data Exchange Program) reports and the CFSTI-TT reports (Technical Translations from the Clearinghouse for Federal Scientific and Technical Information).

| | |
|---|---|
| CCL-183 | |
| AD-620 154 | FLD. 11/9 |
| CRSR-203 | |
| AD-620 250 | FLD. 3/1 |
| DPS-1677 | |
| AD-469 558 | FLD. 19/1A |

## AD-FIELD INDEX

The AD-Field Index is arranged numerically by AD number and lists the field/group where the full entry can be located in TAB.

# SUBJECT INDEX

ıe fields/groups indicated here apply only to the echnical Abstract Bulletin Section (on white paper).


•ABSORPTION SPECTRUM
NITRILES
REPRINT: ABSORPTION SPECTRUM OF THE CCN RADICAL.
AD-629 948 FLD. 7/4

•ACCELERATION
VESTIBULAR APPARATUS
REPRINT: THEORETICAL ASPECTS OF THE ROLE OF ANGULARACCELERATION IN VESTIBULAR STIMULATION.
AD-629 939 FLD. 6/19

•ACCELERATION TOLERANCE
HEART
CINERADIOGRAPHIC OBSERVATIONS OF HUMAN SUBJECTS DURINGTRANSVERSE ACCELERATIONS OF 9GX AND 10GX.
AD-629 294 FLD. 6/19

•ACCLIMATIZATION
RABBITS
SEASONAL ACCLIMATION IN VARYING HARE (LEPUS AMERICANUS).
AD-629 956 FLD. 6/3

•ACETATES
ALKYLATION
REPRINT: ALKYLATIONS OF PHENYLACETIC, ALPHA-ALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERS BY MEANS OF SODAMIDEAND SODIUM HYDRIDE.
AD-629 634 FLD. 7/3

•ACOUSTICS
NUCLEAR EXPLOSIONS
SIMPLIFIED NORMAL MODE TREATMENT OF LONG-PERIODACOUSTIC-GRAVITY WAVES IN THE ATMOSPHERE.
AD-629 232 FLD. 17/1

PROPAGATION
HYDRAULIC ANALOGY OF AN ACOUSTIC WAVE IN A PIPE.
AD-629 088 FLD. 20/14

WAVE FUNCTIONS
REPRINT: THE SCATTERING OF PLANE WAVES FROM PERIODICSURFACES.
AD-629 986 FLD. 20/1

•ACROLEINS
POLAROGRAPHIC ANALYSIS
TRANSLATION OF RUSSIAN RESEARCH: POLAROGRAPHICDETERMINATION OF ACROLEIN IN THE OXIDATION PRODUCTS OFPROPYLENE ON COPPER CATALYSTS.
AD-629 057 FLD. 7/3

•ACRYLIC RESINS
DECOMPOSITION
REPRINT: THERMAL DEPOLYMERIZATION OF POLYMETHYLMETHACRYLATE AND POLY-ALPHA-METHYLSTYRENE IN SOLUTIONIN VARIOUS SOLVENTS.
AD-629 969 FLD. 7/4

STEREOCHEMISTRY
REPRINT: TACTICITY DETERMINATIONS ON ALLYL METHACRYLATEPOLYMERS.
AD-629 977 FLD. 11/9

•ACRYLONITRILE POLYMERS
SEMICONDUCTORS
TRANSLATION OF RUSSIAN RESEARCH: SYNTHESIS OF SEMICONDUCTING COMPOSITES BY RADIATION GASEOUS-PHASEPOLYMERIZATION.
AD-629 912 FLD. 11/4

•ACTUATORS
REMOTE CONTROL SYSTEMS
TRANSLATION OF RUSSIAN PATENT: BELLOWS TYPE DEVICEFOR HYDRAULIC REMOTE CONTROL OF AN ACTUATOR.
AD-629 184 FLD. 13/7

•ADAPTIVE CONTROL SYSTEMS
MATHEMATICAL PROGRAMMING
TRANSLATION OF RUSSIAN RESEARCH: ANALYTICAL CONSTRUCTIONOF THE GUIDANCE SYSTEM OF ROCKETS.
AD-629 093 FLD. 16/2

•ADHESION
THEORY
TRANSLATION OF RUSSIAN RESEARCH: THE INVALIDITY OF APURELY THERMODYNAMIC TREATMENT OF THE ADHESION OFSOLIDS.
AD-629 603 FLD. 7/4

•ADSORPTION
SURFACE PROPERTIES
REPRINT: FINDING HETEROGENEOUS ENERGY DISTRIBUTIONSFROM PHYSICAL ADSORPTION ISOTHERMS.
AD-629 972 FLD. 7/4
REPRINT: PHYSICAL ADSORPTION ISOTHERMS ON HETEROGENEOUSSURFACES AT VERY LOW PRESSURES.
AD-629 973 FLD. 7/4

•AERODYNAMIC LOADING
PITCH(MOTION)
AIR LOADINGS ON A ROTOR BLADE AS CAUSED BY TRANSIENTINPUTS OF COLLECTIVE PITCH.
AD-629 860 FLD. 1/1

•AERODYNAMICS
ROCKET TRAJECTORIES
A FLOW MODEL AND ANALYSIS OF A ROCKET PAIR IN CLOSEPROXIMITY.
AD-629 966 FLD. 19/4

•AERONAUTICS
HANDBOOKS
TRANSLATION OF RUSSIAN REPORT: AVIATION HANDBOOK(FOR THE PILOT AND NAVIGATOR).
AD-629 284 FLD. 1/2

•AIR
PURIFICATION
TRANSLATION OF RUSSIAN RESEARCH: FREEING THE AIR OFMICROFLORA UNDER THE ACTION OF ARTIFICIAL AEROIONIZATION.
AD-629 655 FLD. 6/13

•AIR FORCE
SCIENTIFIC RESEARCH
SCIENTIFIC JOURNALS: AVAILABILITY OF RESEARCH SPONSOREDBY OFFICE OF AEROSPACE RESEARCH.
AD-629 909 FLD. 5/2

•AIR FORCE EQUIPMENT
ENVIRONMENTAL TESTS
EVOLUTION OF USAF ENVIRONMENTAL TESTING.
AD-629 593 FLD. 14/2

SURVIVAL
MINUTES OF THE PERSONAL EQUIPMENT ADVISORY GROUPMEETING, OCT., 1968.
AD-629 901 FLD. 6/17

•AIR FORCE PERSONNEL
PERFORMANCE TESTS
CONCEPTS AND PRACTICES IN THE ASSESSMENT OF HUMANPERFORMANCE IN AIR FORCE SYSTEMS.
AD-629 041 FLD. 5/10

•AIR INTAKE FILTERS
SHELTERS
COLLECTIVE PROTECTOR DESIGN AND DEVELOPMENT.
AD-629 902 FLD. 13/13

•AIR MASS ANALYSIS
UPPER ATMOSPHERE
ATMOSPHERIC MOTION: NULL LAYER CONCEPTION IN STRATOSPHERE AND MESOSPHERE, ESPECIALLY IN SPRING AND FALL.
AD-629 216 FLD. 4/2

•AIR POLLUTION
LABORATORIES
CONTAMINATION OF A LABORATORY BUILDING BY AIR FILTERS.
AD-629 206 FLD. 14/2

LEAD
REPRINT: CONCENTRATIONS OF COMMON LEAD IN GREENLANDSNOWS.
AD-629 947 FLD. 8/3

•AIR TRANSPORTATION
OPERATIONS RESEARCH
MACRO ANALYSIS OF MILITARY AIR TRANSPORTATION.
AD-629 393 FLD. 15/5

•AIRCRAFT
STATIC ELECTRICITY
CORRELATION BETWEEN CLEAR-AIR TURBULENCE AND AIRCRAFTELECTRICAL ACTIVITY.
AD-629 309 FLD. 4/1

•AIRPLANE ENGINE OILS
SOLVENT ACTION
LUBRICATION RESEARCH FOR AERO PROPULSION SYSTEMS: EFFECTOF AIRCRAFT GAS TURBINE ENGINE LUBRICANTS AND VARIOUSSOLVENTS ON REMOVAL OF CARBON DEPOSITS ON BEARING REARSUPPORT.
AD-629 488 FLD. 11/8

•AIRPLANES
CATAPULTS
METHOD FOR ESTIMATING THE CATAPULT PERFORMANCE OF ACARRIER-BASED AIRPLANE.
AD-629 930 FLD. 1/3

•ALGEBRA
TABLES
TAMPER: TABLES FOR APPROXIMATION OF MID-POINTS FOREXPONENTIAL REGRESSION.
AD-629 334 FLD. 12/1

•ALGEBRAS
INPUT-OUTPUT DEVICES
THE ALGEBRA OF BLOCK DIAGRAMS.
AD-629 081 FLD. 12/1

•ALGORITHMS
PROGRAMMING(COMPUTERS)
MONOTONE CONGRUENCE ALGORITHMS.
AD-629 046 FLD. 9/2
METHOD FOR SEEKING DATA AND ITS APPLICATION BY COMPUTER,TO THE ALGORITHM OF CRITICAL PATH DETERMINATION:TRANSLATION OF RUSSIAN PAPER.
AD-629 196 FLD. 9/2

•ALKYLATION
ACETATES
REPRINT: ALKYLATIONS OF PHENYLACETIC, ALPHA-ALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERS BY MEANS OF SODAMIDEAND SODIUM HYDRIDE.
AD-629 634 FLD. 7/3

•ALKYNES
MICROWAVE SPECTROSCOPY
MICROWAVE SPECTROSCOPIC STUDIES OF MOLECULES.
AD-629 997 FLD. 7/4

•ALLOYS
OPTICAL PROPERTIES
OPTICAL PROPERTIES OF COPPER NICKEL, AND A SERIES OFCOPPER-NICKEL ALLOYS.
AD-629 371 FLD. 11/6

•ALUMINIUM ALLOYS
QUANTITATIVE ANALYSIS

DETERMINATION OF THE ALUMINA CONTENT OF ALUMINUM ALLOYS.
AD-625 297 FLD. 11/6

•ALUMINIUM COMPOUNDS
OXIDES
DETERMINATION OF THE ALUMINA CONTENT OF ALUMINUM ALLOYS.
AD-625 297 FLD. 11/6

•ALUMINUM
ANODIC COATINGS
DEVELOPMENT OF A FIXTURE AND A PROCEDURE FOR HARDANODIZING THE SURFACES OF A LONG ALUMINUM TUBE WITH ADEEP BLIND-HOLE.
AD-624 993 FLD. 11/3

EQUATIONS OF STATE
EQUATION OF STATE OF SOLIDS: ALUMINUM AND TEFLON.
AD-625 579 FLD. 20/13

•ALUMINUM ALLOYS
ANTIFRICTION BEARINGS
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF ANTIFRICTIONALLOYS OF THE 'ALCUSIP' TYPE.
AD-624 911 FLD. 11/6

FRACTURE(MECHANICS)
METALLURGICAL CHARACTERISTICS OF HIGH STRENGTH STRUCTURALMATERIALS.
AD-625 374 FLD. 11/6
FRACTURE TOUGHNESS, FATIGUE-CRACK PROPAGATION ANDCORROSION CHARACTERISTICS OF ALUMINUM ALLOY PLATESFOR WING SKINS.
AD-625 494 FLD. 11/6

•ALUMINUM COMPOUNDS
HYDROXIDES
ROCKET ENGINE EXHAUST PRODUCTS: THERMODYNAMICPROPERTIES.
AD-625 598 FLD. 21/9

OXIDES
TRANSLATION OF RUSSIAN RESEARCH: MECHANICAL STRENGTHOF HIGHLY ALUMINOUS CERAMIC.
AD-625 296 FLD. 11/2

•AMINO ACIDS
METABOLISM
REPRINT: BIOSYNTHESIS OF PULCHERRIMINIC ACID.
AD-624 960 FLD. 6/1

•AMMONIA
MASERS
TRANSLATION OF A RUSSIAN PATENT: AMMONIA MASER(AMMONIA MOLECULAR GENERATOR).
AD-625 196 FLD. 20/5

•AMMONIUM COMPOUNDS
PERCHLORATES
STUDY OF THE DECOMPOSITION MECHANISM OF AMMONIUMPERCHLORATE.
AD-625 191 FLD. 7/2

•AMMUNITION
DESIGN
DESIGN OF AMMUNITION: VALUE ENGINEERING RESPONSIBILITYOF THE DESIGNER.
AD-625 659 FLD. 19/1

TEST METHODS
SKIP LOT AND GRAND LOT BALLISTIC TESTING: COMPARISON BYUSE OF COMPUTER SIMULATION.
AD-625 698 FLD. 19/1

•AMPLIFIERS
MICROMINIATURIZATION(ELECTRONICS)
MICROELECTRONIC AMPLIFIERS HAVING MINIMUM SENSITIVITYTO ARBITRARY PARAMETER CHANGES.
AD-625 379 FLD. 9/1

•AMPLITUDE MODULATION
DEMODULATORS
TRANSLATION OF RUSSIAN PATENT: METHOD OF SPEATING ONEAMPLITUDE-MODULATED SIGNAL FROM TWO MIXED AM SIGNALSWITH SUPERPOSED SPECTRA, BUT DIFFERENT CARRIERS.
AD-625 072 FLD. 9/5

•ANALOG COMPUTERS
NONLINEAR DIFFERENTIAL EQUATIONS
ANALOG COMPUTER STUDY OF VAN DER POL'S EQUATION AND ITSRESPONSE TO WHITE GAUSSIAN NOISE.
AD-625 372 FLD. 12/1

•ANALOG SYSTEMS
CABLES(MECHANICAL)
FORCE BALANCE ANALOG FOR DETERMINING CHARACTERISTICSOF OCEAN CABLE SYSTEMS.
AD-625 530 FLD. 13/10

•ANALYSIS OF VARIANCE
ORBITAL TRAJECTORIES
ORBIT DETERMINATION AND ANALYSIS BY THE MINIMUMVARIANCE METHOD.
AD-625 453 FLD. 22/3

SEISMOLOGY
SEISMOLOGY: ANALYSIS OF VARIANCE AS A METHOD OF AUTOMATICSIGNAL DETECTION.
AD-625 545 FLD. 8/11

•ANEMIAS
GENETICS
REPRINT: CELLULAR BASIS OF THE GENETICALLY DETERMINEDHEMOPOIETIC DEFECT IN ANEMIC MICE OF GENOTYPESL/SL(D).
AD-625 523 FLD. 6/16

•ANEMOMETERS
RADIOSONDES
SYSTEM FOR THE DETERMINATION OF THE VERTICAL WIND PROFILEFROM AN AIRCRAFT.
AD-625 188 FLD. 4/2

•ANIMALS
RADIATION EFFECTS
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF IONIZINGRADIATION ON ANIMALS AND PLANTS.
AD-624 934 FLD. 6/18

•ANODES(ELECTRON TUBES)
MAGNETRONS
REPRINT: ANODE STRUCTURES FOR COLD-CATHODE HIGH-POWERMAGNETRONS.
AD-625 583 FLD. 9/1

•ANODIC COATINGS
ALUMINUM
DEVELOPMENT OF A FIXTURE AND A PROCEDURE FOR HARDANODIZING THE SURFACES OF A LONG ALUMINUM TUBE WITH ADEEP BLIND-HOLE.
AD-624 993 FLD. 11/3

•ANTARCTIC REGION
RADIOACTIVITY
ATMOSPHERIC RADIOACTIVITY IN ANTARCTICA 1956-1963.
AD-625 439 FLD. 4/1

•ANTENNA ARRAYS
ELECTROMAGNETIC WAVES
REPRINT: SURFACE-WAVE COUPLING BETWEEN ELEMENTS OFLARGE ARRAYS.
AD-625 016 FLD. 9/5

OPTIMIZATION
OPTIMUM NONUNIFORMLY SPACED ANTENNA ARRAYS.
AD-625 318 FLD. 9/5

SCANNING
LARGE, LOW-COST STEERABLE PLANAR ARRAY.
AD-624 880 FLD. 9/5

•ANTENNA FEEDS
REFLECTORS
SHAPED REFLECTOR AS A PRIMARY FEED FOR HAYSTACK.
AD-625 379 FLD. 9/5

•ANTENNAS
ELECTRICAL IMPEDANCE
REPRINT: CONTROL OF ELECTROMAGNETIC SCATTERING BYIMPEDANCE LOADING.
AD-625 122 FLD. 20/14

•ANTENNAS FEEDS
PARABOLIC ANTENNAS
REPRINT: LATERAL-FEED DISPLACEMENT IN A PARABOLOID.
AD-625 018 FLD. 9/1

•ANTHRONES
MOLECULAR STRUCTURE
REPRINT: STRUCTURE OF BOSTRYCOICIN, A BETA-AZAANTHRAQUINONE FROM FUSARIUM SOLANI D2 PURPLE.
AD-624 993 FLD. 7/3

•ANTIAIRCRAFT DEFENSE SYSTEMS
OPERATIONS RESEARCH
SYSTEMS ANALYSIS OF NAVAL ANTI-AIR WARFARE TRAININGREQUIREMENTS.
AD-625 378 FLD. 5/9

•ANTIBIOTICS
MOLECULAR STRUCTURE
REPRINT: STRUCTURE OF BOSTRYCOICIN, A BETA-AZAANTHRAQUINONE FROM FUSARIUM SOLANI D2 PURPLE.
AD-624 993 FLD. 7/3

•ANTIFERROMAGNETISM
ELECTRON SPIN RESONANCE
ANTIFERROMAGNETIC SPIN RESONANCE OF COBR2.6H2O.
AD-625 539 FLD. 20/3

•ANTIFRICTION BEARINGS
ALUMINUM ALLOYS
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF ANTIFRICTIONALLOYS OF THE 'ALCUSIP' TYPE.
AD-624 911 FLD. 11/6

•ANTIGENS + ANTIBODIES
CYTOCHEMISTRY
TRANSLATION OF RUSSIAN RESEARCH: ANTIGENIC STRUCTUREOF THE BAC. ANTHRACIS VACCINAL STRAIN.
AD-625 649 FLD. 6/13

RADIATION EFFECTS
REPRINT: RADIOSENSITIVITY OF THE IMMUNE RESPONSE TOSHEEP RED CELLS IN THE MOUSE, AS MEASURED BY THE HEMOLYTIC PLAQUE METHOD.
AD-625 502 FLD. 6/18

•ANTIRADAR COATINGS
BIBLIOGRAPHIES
BIBLIOGRAPHY OF R AND D REPORTS OF THE FILM RADARABSORBING MATERIAL PROGRAM.
AD-625 386 FLD. 17/9

•ANXIETY
REACTION(PSYCHOLOGY)
CHANGES IN THE JUDGMENTS OF SENSITIZERS AND REPRESSERS INRESPONSE TO FAILURE AND SUCCESS EVALUATIONS OF GROUPPERFORMANCE.
AD-625 022 FLD. 5/10

•APPROXIMATION(MATHEMATICS)
BENDING
TRANSLATION OF RUSSIAN RESEARCH: APPROXIMATE SOLUTIONOF THE PROBLEM OF BENDING OF A SHALLOW SPHERICAL SHELLWEAKENED BY AN APERTURE.

AD-629 152 FLD. 20/11

DIFFERENTIAL EQUATIONS
APPROXIMATE SOLUTION OF THE CROCCO EQUATION.
AD-629 206 FLD. 12/1

HEAT TRANSFER
REPRINT: METHOD OF WEIGHTED RESIDUALS AND ITS RELATIONTO CERTAIN VARIATIONAL PRINCIPLES FOR THE ANALYSIS OFTRANSPORT PROCESSES.
AD-629 551 FLD. 9/1

MESON SCATTERING
REPRINT: MODIFIED ISOBAR APPROXIMATION FOR PI-RHOSCATTERING.
AD-629 950 FLD. 20/8

POLYNOMIALS
REPRINT: PIECEWISE POLYNOMIAL INTERPOLATION ANDAPPROXIMATION.
AD-629 863 FLD. 12/1

WAVE FUNCTIONS
REPRINT: NUMERICAL SOLUTION OF FIXED-SOURCE FIELDTHEORIES.
AD-629 597 FLD. 20/10

•APTITUDE TESTS
PERSONNEL MANAGEMENT
OPTIMAL ALLOCATION OF ENLISTED MEN: FULL REGRESSIONEQUATIONS VS. APTITUDE AREA SCORES.
AD-629 224 FLD. 5/9

•ARC HEATERS
PLASMA MEDIUM
ARC HEATING IN A TUBE.
AD-629 598 FLD. 20/9

•ARC WELDING
JOINTS
TRANSLATION OF RUSSIAN PATENT. METHOD OF AUTOMATICWELDING OF STATIONARY OBJECTS WITH CLOSED LINEAR JOINTS.
AD-629 068 FLD. 13/8

•ARCHEOLOGY
STATISTICAL DATA
STATISTICAL METHODS OF TIME SEQUEING.
AD-629 960 FLD. 12/1

•ARMED FORCES OPERATIONS
COSTS
SYSTEM COST ANALYSIS: A MANAGEMENT TOOL FOR DECISIONMAKING.
AD-629 893 FLD. 5/3
COMPUTERIZED TECHNIQUE TO EXPRESS UNCERTAINTY IN ADVANCEDSYSTEM COST ESTIMATES.
AD-629 899 FLD. 5/3

WEATHER FORECASTING
TRANSLATION OF RUSSIAN RESEARCH: WAR AND WEATHER.
AD-629 195 FLD. 15/7

•ARMED FORCES TRANSPORTATION
AIR TRANSPORTATION
MACRO ANALYSIS OF MILITARY AIR TRANSPORTATION.
AD-629 353 FLD. 15/5

•AROMATIC COMPOUNDS
SPECTRA(INFRARED)
INFRARED STUDY OF POLYFLUORINATED AROMATICS IN THE LOWFREQUENCY REGION.
AD-629 125 FLD. 7/3

•ARSENIC ALLOYS
REFRACTORY METAL ALLOYS
REPRINT: THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM.
AD-629 967 FLD. 11/6

•ARSENIC COMPOUNDS
SPECTRA(INFRARED)
REPRINT: INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARY ARSINE OXIDES.
AD-629 696 FLD. 7/4

•ARTIFICIAL INTELLIGENCE
PATTERN RECOGNITION
APPLICATION OF MICROELECTRONICS TO SYNTHETIC NERVENETWORKS.
AD-629 229 FLD. 6/4

•ARTIFICIAL INTELLIGENCE
MODELS(SIMULATIONS)
FAMILY OF COMPLEX SYSTEMS AS A MODEL OF ORGANISMS'BEHAVIOR.
AD-629 869 FLD. 6/4

•ASTRONOMICAL GEODESICS
MATRIX ALGEBRA
REDUCTION PROCEDURES FOR ABSOLUTE DIRECTION AND GEODETICAZIMUTHS FROM OPTICAL OBSERVATIONS OF SATELLITES.
AD-629 356 FLD. 8/4

SATELLITES(ARTIFICIAL)
RESULTS OF SPACE TRIANGULATION ADJUSTMENTS FROM SATELLITEDATA.
AD-629 258 FLD. 8/4

•ASTROPHYSICS
SPECTROPHOTOMETERS
REPRINT: A DUAL-CHANNEL PULSE-COUNTING ASTRONOMICALSPECTROPHOTOMETER.
AD-629 882 FLD. 3/2

SYMPOSIA
IINTERNATIONAL YEARS OF THE QUIET SUN: SYMPOSIA HELD ATBUENOS AIRES, ARGENTINA.
AD-629 036 FLD. 4/1

•ATMOSPHERE
INFRARED RADIATION
BALLOON BORNE INFRARED STUDIES.
AD-629 349 FLD. 4/1

OPTICAL PROPERTIES
NUMERICAL ESTIMATES OF LUMINANCE AND TOTAL BRIGHTNESS OFTHE TERRESTRIAL HALO.
AD-629 233 FLD. 4/1

RADIOFREQUENCE INTERFERENCE
EXPERIMENTAL INVESTIGATION OF THE COHERENCE DISTANCE OFTHE ATMOSPHERE FOR MICROWAVES.
AD-629 991 FLD. 20/14

•ATMOSPHERE MODELS
DIFFERENTIAL EQUATIONS
INITIALIZATION OF PRIMITIVE-EQUATION MODELS FOR NUMERICALWEATHER PREDICTION.
AD-629 348 FLD. 4/2

•ATMOSPHERIC ENTRY
INTERPLANETARY TRAJECTORIES
INVESTIGATION OF THE EFFECT OF LAUNCH SITE LOCATION ANDVARIATION OF LAUNCH PARAMETERS ON LUNAR-EARTH TRAJECTORIES.
AD-629 399 FLD. 22/3

•ATMOSPHERIC MOTION
CLIMATOLOGY
ATMOSPHERIC MOTION: NULL LAYER CONCEPTION IN STRATOSPHERE AND MESOSPHERE, ESPECIALLY IN SPRING AND FALL.
AD-629 216 FLD. 4/2

MICROMETEOROLOGY
TRANSLATION OF RUSSIAN RESEARCH: THE STRUCTURE OF THEFIELDS OF WIND-VELOCITY AND TEMPERATURE IN THE SURFACELAYER OF THE ATMOSPHERE.
AD-629 621 FLD. 4/2

•ATMOSPHERIC PRECIPITATION
IONS
ION FRACTIONATION IN DROPS FROM BREAKING BUBBLES.
AD-629 179 FLD. 7/4

•ATMOSPHERIC REFRACTION
SOLAR RADIATION
SCATTERING OF SUNLIGHT INTO PLANETARY SHADOW CONES.
AD-629 260 FLD. 4/1

•ATMOSPHERIC SOUNDING
NUMERICAL ANALYSIS
ATMOSPHERIC SOUNDING: OBJECTIVE CROSS-SECTION ANALYSIS.
AD-629 137 FLD. 4/1

PROBES
MEASUREMENT OF WIND SHEAR.
AD-629 339 FLD. 4/2

RESEARCH AIRCRAFT
SYSTEM FOR THE DETERMINATION OF THE VERTICAL WIND PROFILEFROM AN AIRCRAFT.
AD-629 188 FLD. 4/2

SOUNDING ROCKETS
EVALUATION OF METEOROLOGICAL ROCKET WIND SENSORS.
AD-629 388 FLD. 4/2
SOUNDING ROCKET: DESIGN, DEVELOPMENT AND FLIGHT TESTRESULTS OF THE LOKI INSTRUMENTED DART SYSTEM.
AD-629 481 FLD. 4/2

SYMPOSIA
SYMPOSIUM ON METEOROLOGICAL ROCKETS.
AD-629 394 FLD. 14/2

•ATMOSPHERIC TIDES
NUCLEAR EXPLOSIONS
SIMPLIFIED NORMAL MODE TREATMENT OF LONG-PERIODACOUSTIC-GRAVITY WAVES IN THE ATMOSPHERE.
AD-629 232 FLD. 17/1

•ATOMIC CLOCKS
ELECTRON TRANSITIONS
REPRINT: CESIUM-BEAM FREQUENCY STANDARD FOR DEFININGAN ATOMIC SECOND AND AN ATOMIC TIME SCALE.
AD-629 976 FLD. 14/2

•ATOMIC ENERGY LEVELS
METALS
ONE-PARTICLE PROPERTIES OF AN INHOMOGENEOUS INTERACTINGELECTRON GAS.
AD-629 343 FLD. 7/4

WAVE FUNCTIONS
LOWER BOUNDS FOR THE EIGENVALUES OF FIRST ORDER DENSITYMATRICES.
AD-629 212 FLD. 7/4

•ATOMIC ORBITALS
DENSITY
LOWER BOUNDS FOR THE EIGENVALUES OF FIRST ORDER DENSITYMATRICES.
AD-629 212 FLD. 7/4

MATHEMATICAL MODELS
INDEPENDENT PARTICLE MODEL FOR MANY-ELECTRON SYSTEM.SYMMETRY PROPERTIES AND CRITERIA FOR THE VALIDITY OF THEINDEPENDENT PARTICLE MODEL.
AD-629 213 FLD. 7/4

•ATOMIC SPECTROSCOPY
ELECTRON TRANSITIONS
RESEARCH ON F-VALUES IN THE USSR.
AD-629 996 FLD. 7/4

SODIUM COMPOUNDS
ATOMIC FLUORESENCE OF SODIUM

IODIDE.
AD-629 029 FLD. 7/4

•ATTITUDES
BARGAINING
PERSONALITY/ATTITUDE SCHEDULE FOR USE IN EXPERIMENTALBARGAINING STUDIES.
AD-629 992 FLD. 5/10

PERSONALITY
COGNITIVE DETERMINANT OF IMPRESSION FORMATION.
AD-629 019 FLD. 5/10

VERBAL BEHAVIOR
EFFECT OF ROLE-REVERSAL DURING THE DISCUSSION OFOPPOSING VIEWPOINTS.
AD-629 919 FLD. 5/10
TECHNIQUES OF INDUCING COOPERATION BETWEEN ADVERSARIES.
AD-629 921 FLD. 5/10

•AUDITORY PERCEPTION
CONDITIONED REFLEX
REPRINT: BAR PRESSING BY THE RAT AS A FUNCTION OF AUDITORYSTIMULATION.
AD-629 102 FLD. 5/10

FISHES
REPRINT: AUDITORY CAPACITIES IN FISHES: THRESHOLDVARIABILITY IN THE BLUE-STRIPED GRUNT, HAEMULONSCIURUS.
AD-629 299 FLD. 6/3

•AURORAE
TERRESTRIAL MAGNETISM
TRANSLATION OF RUSSIAN RESEARCH: AURORAS AND IRONDEPOSITS.
AD-629 290 FLD. 4/1

•AUTOIGNITION
CHEMICAL REACTIONS
TRANSLATION OF RUSSIAN RESEARCH: THE TRANSIENT THEORY OFTHERMAL SELF-IGNITION.
AD-629 151 FLD. 21/2

•AUTOMATA
MAPPING(TRANSFORMATIONS)
STRUCTURE AND AUTOMORPHISMS OF FINITE AUTOMATA.
AD-629 239 FLD. 9/2

•AXIAL-FLOW COMPRESSORS
DESIGN
AXIAL COMPRESSOR DESIGN USING ISENTROPIC OR NONISENTROPICSIMPLE RADIAL EQUILIBRIUM EQUATION.
AD-629 079 FLD. 13/7

•BACILLUS ANTHRACIS
ANTIGENS + ANTIBODIES
TRANSLATION OF RUSSIAN RESEARCH: ANTIGENIC STRUCTUREOF THE BAC. ANTHRACIS VACCINAL STRAIN.
AD-629 649 FLD. 6/13

CULTURE MEDIA
TRANSLATION OF RUSSIAN RESEARCH: PROPERTIES OF CULTURESOF ANTHRAX BACILLI GROWN AT VARIOUS TEMPERATURES.
AD-629 629 FLD. 6/13

VACCINES
TRANSLATION OF RUSSIAN RESEARCH: COMPATIBILITY OF ANTHRAXSTI VACCINE IN ASSOCIATION WITH PLAGUE TULAREMIA ANDBRUCELLOSIS VACCINES.
AD-629 611 FLD. 6/13
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF IMMUNOGENESISIN GUINEA PIGS VACCINATED WITH BRUCELLOSIS AND ANTHRAXVACCINE.
AD-629 691 FLD. 6/13

•BACTERIAL AEROSOLS
DYNAMICS
TRANSLATION OF RUSSIAN RESEARCH: DYNAMICS OF A BACTERIALAEROSOL IN THE DUST AND DROP PHASE.
AD-629 618 FLD. 13/2

SERRATIA MARCESCENS
TRANSLATION OF RUSSIAN RESEARCH: POSSIBILITY OF USING BPRODIGIOSUM AS AN EXPERIMENTAL BACTERIAL AEROSOLMODEL.
AD-629 616 FLD. 6/13

•BALLAST
UNDERWATER PROPULSION
LOCOMOTION OF OCEAN BOTTOM VEHICLE BY SHIFTING BALLAST.
AD-629 921 FLD. 13/10

•BALLISTICS
TEST METHODS
SKIP LOT AND GRAND LOT BALLISTIC TESTING: COMPARISON BYUSE OF COMPUTER SIMULATION.
AD-629 698 FLD. 19/1

•BAND THEORY OF SOLIDS
GRAPHITE
REPRINT: SPIN-ORBIT INTERACTION IN GRAPHITE.
AD-629 017 FLD. 20/12

•BANDWIDTH
OPTIMIZATION
REPRINT: OPTIMIZING EFFICIENCY AND BANDWIDTH OF INDUCTIVELYLOADED ANTENNAS.
AD-629 951 FLD. 9/5

•BARGAINING
SOCIAL PSYCHOLOGY
PERSONALITY/ATTITUDE SCHEDULE FOR USE IN EXPERIMENTALBARGAINING STUDIES.
AD-629 992 FLD. 5/10

•BARIUM COMPOUNDS
FUEL ADDITIVES
TRANSLATION OF A RUSSIAN PATENT: BARIUM NAPHTHENATEADDITIVE TO SULFUROUS DIESEL-ENGINE FUELS.
AD-629 246 FLD. 21/4

•BEAMS(STRUCTURAL)
LOADING(MECHANICS)
RESPONSE OF A BEAM TO AN IMPACT LOADING.
AD-629 991 FLD. 20/11

•BEHAVIOR
CONDITIONED REFLEX
RESPONSE DURATION AND INTERRESPONSE TIME UNDER FR-9AND VR9 SCHEDULES AND SUBSEQUENT EXTINCTION.
AD-629 929 FLD. 5/10

GROUP DYNAMICS
REPRINT: SOME PERSONAL AND SITUATIONAL FACTORSRELEVANT TO THE CONSISTENCY AND PREDICTION OF CONFORMINGBEHAVIOR.
AD-629 280 FLD. 5/10
BASES AND CONSEQUENCES OF SYSTEMS OF COMMUNICATION.
AD-629 922 FLD. 5/10
EFFECT OF VARIATIONS IN INTERNAL POWER PATTERN ON COALITIONFORMATION IN TETRADS.
AD-629 992 FLD. 5/10

SOCIAL PSYCHOLOGY
REWARD STRUCTURE AND INFORMATION IN THE DEVELOPMENT OFCOOPERATION IN TWO-PERSON, TWO-CHOICE GAMES.
AD-629 920 FLD. 5/10
TECHNIQUES OF INDUCING COOPERATION BETWEEN ADVERSARIES.
AD-629 921 FLD. 5/10
SOCIAL MOTIVES AND DECISION-MAKING BEHAVIOR IN INTERPERSONAL SITUATIONS.
AD-629 987 FLD. 5/10

•BENDING
STRUCTURAL SHELLS
TRANSLATION OF RUSSIAN RESEARCH: APPROXIMATE SOLUTIONOF THE PROBLEM OF BENDING OF A SHALLOW SPHERICAL SHELLWEAKENED BY AN APERTURE.
AD-629 192 FLD. 20/11

•BERYLLIUM COMPOUNDS
ALUMINATES
REPRINT: HEAT CAPACITY AND THERMODYNAMIC PROPERTIESOF BERYLLIUM ALUMINATE (CHRYSOBERYL), BEO-A1203, FROM16 TO 980K.
AD-629 096 FLD. 20/13

HYDROXIDES
ROCKET ENGINE EXHAUST PRODUCTS: THERMODYNAMICPROPERTIES.
AD-629 998 FLD. 21/9

•BETA PARTICLES
RADIOLOGICAL DOSAGE
DISINTEGRATION RATE MULTIPLIERS IN BETA-EMITTER DOSECALCULATIONS.
AD-629 399 FLD. 6/18

•BIBLIOGRAPHIES
ANTIRADAR COATINGS
BIBLIOGRAPHY OF R AND D REPORTS OF THE FILM RADARABSORBING MATERIAL PROGRAM.
AD-629 986 FLD. 17/9

ENERGY CONVERSION
MATERIALS FOR HIGH-TEMPERATURE ENERGY CONVERTERS: ANNOTATED BIBLIOGRAPHY BASED ON SOVIET OPEN-SOURCE MATERIALS.
AD-629 198 FLD. 10/1

METALS
HIGH-PURITY METALS: ANNOTATED BIBLIOGRAPHY BASED ONSOVIET AND SOVIET-BLOC OPEN-SOURCE MATERIAL.
AD-629 997 FLD. 11/6

•BIOLOGICAL LABORATORIES
SAFETY
RECOVERY OF SPECIFIC MICROORGANISMS FROM URINE ANDFECES OF INFECTED ANIMALS.
AD-629 256 FLD. 6/13

•BIOLOGICAL WARFARE
UNITED STATES
SURVEY OF WEAPONS AND HAZARDS WHICH MAY FACE THEUNITED STATES PEOPLE IN WARTIME.
AD-629 251 FLD. 15/3

•BIONICS
MICROMINIATURIZATION(ELECTRONICS)
APPLICATION OF MICROELECTRONICS TO SYNTHETIC NERVENETWORKS.
AD-629 229 FLD. 6/4

•BIRDS
RADAR ECHO AREAS
REPRINT: ON MEASURING THE RADAR CROSS SECTIONS OF DUCKSAND CHICKENS.
AD-629 163 FLD. 17/9

•BISMUTH
NEUTRON SPECTRUM
NEUTRON SPECTRA FROM MONOENERGETIC PHOTONS OF BISMUTH.
AD-629 963 FLD. 20/8

•BISMUTH COMPOUNDS
TITANATES
REPRINT: SWITCHING BEHAVIOR OF FERROELECTRIC BI4TI3012.
AD-629 013 FLD. 20/3

•BLEED SYSTEMS
STEAM TURBINES

TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL STUDY OF AMODEL CONTROL BLEEDER STAGE WITH A ROTATING DIAPHRAGM.
AD-629 194 FLD. 21/5

•BLOOD DISEASES
THAILAND
REPRINT: HAEMOGLOBIN J AND E IN A THAI KINDRED.
AD-629 459 FLD. 6/5

VIETNAM
REPRINT: HAEMOGLOBIN E IN VIETNAMESE.
AD-629 111 FLD. 6/5

•BLUNT BODIES
SUPERSONIC CHARACTERISTICS
TRANSLATION OF RUSSIAN RESEARCH: ANALYSIS OF FLOWNEAR A BLUNT SOLID OF REVOLUTION AT ANGLE OF ATTACK INSUPERSONIC FLOW OF GAS.
AD-629 236 FLD. 20/4

•BODIES OF REVOLUTION
STRESSES
TRANSLATION OF RUSSIAN RESEARCH: STRESSED STATE AROUND ACIRCULAR HOLE IN A SHELL OF REVOLUTION WITH A SHALLOWMERIDIAN ARC.
AD-629 076 FLD. 20/11

SUPERSONIC CHARACTERISTICS
TRANSLATION OF RUSSIAN RESEARCH: ANALYSIS OF FLOWNEAR A BLUNT SOLID OF REVOLUTION AT ANGLE OF ATTACK INSUPERSONIC FLOW OF GAS.
AD-629 236 FLD. 20/4

•BODY FLUIDS
CONDUCTIVITY
THERMAL AND ELECTRICAL CONDUCTIVITIES OF BIOLOGICAL FLUIDSAND TISSUES.
AD-629 897 FLD. 6/5

•BONDING
POLYAMIDE PLASTICS
TRANSLATION OF RUSSIAN PATENT: METHOD OF BONDINGPOLYAMIDES TO METALS.
AD-629 228 FLD. 13/8

•BORIDES
METALLIC COMPOUNDS
HEATS OF FORMATION OF METALLIC BORIDES BY FLUORINE BOMBCALORIMETRY.
AD-629 336 FLD. 7/4

•BORON ALLOYS
PHASE STUDIES
TERNARY INTERSTITIAL COMPOUNDS OF BORON AND NITROGEN WITHTRANSITION AND POST-TRANSITION METALS.
AD-629 028 FLD. 11/6

•BORON COMPOUNDS
FLUORIDES
REPRINT: EXCHANGE REACTIONS IN THE SYSTEM BORON TRIFLUORIDEMETHANOL.
AD-629 969 FLD. 7/4

HYDROXIDES
ROCKET ENGINE EXHAUST PRODUCTS: THERMODYNAMICPROPERTIES.
AD-629 598 FLD. 21/9

•BOSONS
FIELD THEORY
REPRINT: NOTE ON FIELD THEORIES WITHOUT MASSRENORMALIZATION.
AD-629 599 FLD. 20/8

N-BODY PROBLEM
REPRINT: QUANTUM MECHANICS OF A MANY-BOSON SYSTEM ANDTHE REPRESENTATION OF CANONICAL VARIABLES.
AD-629 971 FLD. 20/10

•BOUNDARY LAYER
EQUATIONS
INITIAL CONDITIONS FOR BOUNDARY LAYER EQUATIONS.
AD-629 207 FLD. 20/4

•BOUNDARY LAYER TRANSITION
TURBULENCE
REPRINT: TURBULENCE DEVELOPMENT IN THE BOUNDARY LAYERWITH PRESSURE GRADIENT.
AD-629 361 FLD. 20/4

•BOUNDARY VALUE PROBLEMS
FLUID FLOW
REPRINT: FREE BOUNDARY PROBLEMS FOR VISCOUS FLOWS INCHANNELS.
AD-629 862 FLD. 20/4

•BRUCELLA
VACCINES
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF IMMUNOGENESISIN GUINEA PIGS VACCINATED WITH BRUCELLOSIS AND ANTHRAXVACCINE.
AD-629 691 FLD. 6/13

•BUBBLES
DROPS
ION FRACTIONATION IN DROPS FROM BREAKING BUBBLES.
AD-629 179 FLD. 7/4

PERMEABILITY
TRANSFER OF AIR THROUGH ADSORBED SURFACE FILMS AS AFACTOR IN FOAM STABILITY.
AD-629 344 FLD. 11/11

STABILITY
SURFACE VISCOSITY OF DETERGENT SOLUTIONS AS A FACTOR INFOAM STABILITY.
AD-629 346 FLD. 11/11

•BUOYS
POWER SUPPLIES
1) WATT THERMOELECTRIC POWER SYSTEM FOR BUOYAPPLICATIONS.
AD-629 478 FLD. 10/2

•CABLES(MECHANICAL)
MOORING
FORCE BALANCE ANALOG FOR DETERMINING CHARACTERISTICSOF OCEAN CABLE SYSTEMS.
AD-629 930 FLD. 13/10

•CADMIUM ALLOYS
SELENIUM ALLOYS
MICROELECTRONIC SOLID-STATE DISPLAY ASSEMBLY.
AD-629 270 FLD. 9/5

•CADMIUM COMPOUNDS
SULFIDES
PHYSICAL RESEARCH ON PROPERTIES OF II-VI COMPOUNDSEMICONDUCTORS.
AD-629 476 FLD. 20/12

•CALCIUM COMPOUNDS
PHASE STUDIES
SEPARATION OF HYDRO-AZEOTROPES: TRANSLATION OF RUSSIANDOCUMENT.
AD-629 430 FLD. 7/4

•CALCULUS OF VARIATIONS
EQUATIONS OF MOTION
REPRINT: SOLUTION OF A BETHE-SALPETER EQUATION.
AD-629 596 FLD. 20/8

POTENTIAL SCATTERING
REPRINT: TAMM VARIATIONAL PRINCIPLE AND ITS GENERALIZATIONTO THE SCATTERING AMPLITUDE.
AD-629 278 FLD. 20/10

STATISTICAL ANALYSIS
REPRINT: METHOD OF WEIGHTED RESIDUALS AND ITS RELATIONTO CERTAIN VARIATIONAL PRINCIPLES FOR THE ANALYSIS OFTRANSPORT PROCESSES.
AD-629 991 FLD. 9/1

•CALIBRATION
TRANSDUCERS
STANDARDIZED TRANSDUCER CALIBRATION SYSTEM FOR NAVALSHIPYARD TRANSDUCER REPAIR FACILITIES.
AD-629 926 FLD. 14/2

•CANCER
RADIATION SICKNESS
SEQUENCE OF EVENTS IN RADIATION CARCINOGENESIS.
AD-629 917 FLD. 6/18

•CANDIDA
ORGANIC PIGMENTS
REPRINT: BIOSYNTHESIS OF PULCHERRIMINIC ACID.
AD-629 960 FLD. 6/1

•CAPACITORS
FILMS
IMPROVED THIN-FILM CAPACITOR CHARACTERISTICS BYREANODIZATION.
AD-629 931 FLD. 9/1

RADIATION DAMAGE
TRANSLATION OF RUSSIAN RESEARCH: ABOUT RADIATION INJURIESTO RADIO COMPONENTS IN A SHARP GAMMA-RADIATION FIELD.
AD-629 039 FLD. 18/8

•CARBON
SOLVENTS
LUBRICATION RESEARCH FOR AERO PROPULSION SYSTEMS: EFFECTOF AIRCRAFT GAS TURBINE ENGINE LUBRICANTS AND VARIOUSSOLVENTS ON REMOVAL OF CARBON DEPOSITS ON BEARING REARSUPPORT.
AD-629 985 FLD. 11/8

•CARBON DIOXIDE
REDUCTION(CHEMISTRY)
DESIGN OF A TEST MODEL FOR A SOLID ELECTROLYTE CARBONDIOXIDE REDUCTION SYSTEM.
AD-629 982 FLD. 6/11

•CARTRIDGES(PAD)
EXPERIMENTAL DESIGN
DESIGN IMPROVEMENT OF HIGH TEMPERATURE INITIATORDESIGNATED 'INITIATOR, CARTRIDGE ACTUATED: XM100.'
AD-629 512 FLD. 19/1

•CASE HARDENING
ZIRCONIUM
TRANSLATION OF RUSSIAN RESEARCH: INVESTIGATION OF THEFORMATION OF AN ALPHA-SOLID SOLUTION OF NITROGEN INZIRCONIUM AT HIGH TEMPERATURES.
AD-629 161 FLD. 13/8

•CASTINGS
IRON ALLOYS
INVESTIGATION OF SOLIDIFICATION OF HIGH-STRENGTH STEELCASTINGS.
AD-629 987 FLD. 11/6

•CATALYSTS
COPOLYMERIZATION
REPRINT: COMPARISON OF CATALYTIC SYSTEMS FOR THEIONIC COPOLYMERIZATION OF STYRENE AND P-METHYLSTYRENE.
AD-629 941 FLD. 11/9

FUEL CELLS
FUEL CELL CATALYSTS.
AD-629 127 FLD. 10/2

•CAVITATION
MACHINES
HYDRODYNAMICS OF TURBOMACHINES.
AD-629 918 FLD. 10/1

•CELESTIAL MECHANICS
INTERPLANETARY TRAJECTORIES
INVESTIGATION OF THE EFFECT OF LAUNCH SITE LOCATION ANDVARIATION OF LAUNCH PARAMETERS ON LUNAR-EARTH TRAJECTORIES.
AD-629 394 FLD. 22/3

•CELLS(BIOLOGY)
TRANSPORT PROPERTIES
REPRINT: THE MEMBRANE THEORY AND OTHER VIEWS FOR SOLUTEPERMEABILITY, DISTRIBUTION, AND TRANSPORT IN LIVING CELLS.
AD-629 871 FLD. 6/3

•CELLULOSE ACETATES
MEMBRANES
REPRINT: CHARACTERISTICS OF POROUS CELLULOSE ACETATEMEMBRANES FOR THE SEPARATION OF SOME ORGANIC SUBSTANCESIN AQUEOUS SOLUTION.
AD-629 966 FLD. 7/9

•CEMENTS
FRACTURE(MECHANICS)
FRACTURE OF GYPSUM PLASTERS AND CEMENT MORTARS BYDYNAMIC LOADING.
AD-629 958 FLD. 11/2

•CENTRIFUGAL PUMPS
TESTS
TRANSLATION OF RUSSIAN RESEARCH: RESULTS OF TESTINGTHE STAGES OF CENTRIFUGAL PUMPS WITH VARIOUS FLOW TWISTSAT THE INPUT INTO THE WHEEL.
AD-629 291 FLD. 13/11

•CERAMIC MATERIALS
CRYSTALLOGRAPHY
ENGINEERING AND APPLIED PHYSICS RESEARCH PROGRESSREPORT NO. 2, SEPTEMBER 1, 1964-SEPTEMBER 1, 1965.
AD-629 921 FLD. 20/2

MECHANICAL PROPERTIES
TRANSLATION OF RUSSIAN RESEARCH: MECHANICAL STRENGTHOF HIGHLY ALUMINOUS CERAMIC.
AD-629 296 FLD. 11/2

•CEREBRAL CORTEX
SLEEP
REPRINT: L'ACTIVITE ELECTRIQUE PHASIQUE DU CORTEX ET DUTHALAMUS AU COURS DU SOMMEIL DESYNCHRONISE CHEZ LECHAT (PHASIC ELECTRICAL ACTIVITY OF THE CORTEX AND OF THETHALAMUS DURING DESYNCHRONIZED SLEEP OF THE CAT).
AD-629 342 FLD. 6/16

•CERIUM COMPOUNDS
DIOXIDES
PRODUCTION OF VISIBLE LIGHT BY THE THORIA-CERIA MANTLE;PHYSICAL CHARACTERISTICS AND A PROPOSED THEORY OF THEOCCURRING MECHANISMS AND PROCESSES.
AD-629 008 FLD. 7/9

•CESIUM
IONIZATION
CESIUM IONIZATION CROSS SECTION FROM THRESHOLD TO 90 EV.
AD-629 951 FLD. 7/9

PLASMA MEDIUM
BASIC PLASMA PROCESSES.
BEHAVIOR OF ALKALI METAL VAPORPLASMAS.
AD-629 927 FLD. 20/9

RESISTANCE(ELECTRICAL)
REPRINT: EFFECT OF PRESSURE AND TEMPERATURE ON THE ELECTRICAL RESISTANCE OF RUBIDIUM AND CAESIUM.
AD-629 970 FLD. 11/6

•CHECKOUT EQUIPMENT
AUTOMATION
SOME ASPECTS OF AUTOMATIC TEST AND CHECKOUT IN MISSILEAND SPACE SYSTEMS.
AD-629 392 FLD. 16/1

•CHECKOUT PROCEDURES
FAILURE(ELECTRONICS)
ELECTRICAL ENGINEERING: INVESTIGATION OF FAULT DIAGNOSIS BYTRANSFER FUNCTION TECHNIQUES.
AD-629 587 FLD. 9/3

•CHELATE COMPOUNDS
SEMICONDUCTORS
TRANSLATION OF RUSSIAN RESEARCH: SEMICONDUCTING ANDOPTICAL PROPERTIES OF DITHIOCARBAMATES OF COPPER, NICKEL,ZINC AND CADMIUM.
AD-629 193 FLD. 20/12

•CHEMICAL ANALYSIS
CANADA
REPRINT: DEVELOPMENTS IN ANALYTICAL CHEMISTRY BY THENATIONAL RESEARCH COUNCIL OF CANADA.
AD-629 975 FLD. 7/2

•CHEMICAL CONTAMINATION
LABORATORIES
CONTAMINATION OF A LABORATORY BUILDING BY AIR FILTERS.
AD-629 306 FLD. 14/2

•CHEMICAL INDUSTRY
USSR
TRANSLATION OF RUSSIAN ARTICLE: GAS IN THE CHEMICAL INDUSTRY.
AD-629 612 FLD. 7/3

•CHEMICAL REACTIONS
MEASUREMENT
TRANSLATION OF RUSSIAN RESEARCH: CONTRIBUTION TO THEPROBLEM OF ESTIMATING THE LENGTH OF THE CHEMICAL REACTIONZONE BEHIND THE FRONT OF A DETONATION WAVE.
AD-629 574 FLD. 19/4
REPRINT: SOME CHEMICAL APPLICATIONS OF THERMODILATOMETRICANALYSIS.
AD-629 589 FLD. 7/4

REACTION KINETICS
THEORY OF INTERNAL RELAXATION IN CHEMICAL KINETICS.
AD-629 377 FLD. 7/4

•CHEMICAL WARFARE
UNITED STATES
SURVEY OF WEAPONS AND HAZARDS WHICH MAY FACE THEUNITED STATES PEOPLE IN WARTIME.
AD-629 291 FLD. 15/3

•CHILDREN
PERCEPTION(PSYCHOLOGY)
REPRINT: SPATIAL ORGANIZATION OF CHILDREN'S RESPONSESTO A PICTORIAL DISPLAY.
AD-629 107 FLD. 5/10

•CHIMPANZEES
REVIEWS
SURVEY OF EXISTING METHODS OF FEEDING AND HOUSING THECHIMPANZEE.
AD-629 101 FLD. 6/3

VISION
REFRACTIVE CHARACTERISTICS AND INTRAOCULAR TENSIONS OFCOLONY CHIMPANZEES.
AD-629 333 FLD. 6/3

•CHLORELLA
PHOTOSYNTHESIS
PHOTOSYNTHETIC MECHANISMS UNDER SUB-OPTIMAL CONDITIONS:OXYGEN PARTIAL PRESSURE AND GLYCOLLIC ACID PRODUCTION INCHLORELLA.
AD-629 495 FLD. 6/1

•CHLORIDES
RESISTANCE(ELECTRICAL)
ELECTRICAL EFFECTS OF SHOCK WAVES: CONDUCTIVITY IN CSI, KI, AND NACL.
AD-629 568 FLD. 20/11

•CHLOROPLASTS
PHOSPHORYLATION
REPRINT: LIGHT EFFECTS ON OXYGEN EVOLUTION AND PHOSPHORYLATION IN SPINACH CHLOROPLASTS.
AD-629 097 FLD. 6/3

•CHROMOSPHERE
ULTRAVIOLET SPECTROSCOPY
REPRINT: ROCKET SPECTRA OF THE CHROMOSPHERE.
AD-629 134 FLD. 3/2

•CIVIL DEFENSE SYSTEMS
SWITZERLAND
SWISS CIVIL DEFENSE.
AD-629 929 FLD. 15/3

TRAINING
TRAINING REQUIREMENTS FOR POSTATTACK ADAPTIVE BEHAVIOR.
AD-629 870 FLD. 15/3

URBAN AREAS
ECONOMIC FEASIBILITY OF DECENTRALIZED METROPOLITANREGIONS.
AD-629 172 FLD. 15/3

•CIVIL ENGINEERING
SOIL MECHANICS
LABORATORY STUDIES ON THE EFFECTS OF LABORATORY SIMULATEDEARTHQUAKE LOADINGS ON COHESIVE SOIL STRENGTH, SAN LUIS DAMAND CANAL--SAN LUIS UNIT CENTRAL VALLEY PROJECT, CALIFORNIA.
AD-629 993 FLD. 8/13

•CLEAN ROOMS
AIR POLLUTION
CONTAMINATION OF A LABORATORY BUILDING BY AIR FILTERS.
AD-629 306 FLD. 14/2

•CLEANING COMPOUNDS
FOAMS
TRANSFER OF AIR THROUGH ADSORBED SURFACE FILMS AS AFACTOR IN FOAM STABILITY.
AD-629 344 FLD. 11/11
PRIMARY ADSORPTION DURING SURFACTANT FOAM FORMATION.
AD-629 345 FLD. 11/11

•CLEAR AIR TURBULENCE
ELECTRICAL PROPERTIES
CORRELATION BETWEEN CLEAR-AIR TURBULENCE AND AIRCRAFTELECTRICAL ACTIVITY.
AD-629 309 FLD. 4/1

•CLOSTRIDIUM BOTULINUM
CULTURE MEDIA
TRANSLATION OF RUSSIAN RESEARCH: NITROGENOUSSUBSTANCE CHANGES IN THE NUTRITIVE BROTHS PREPARED FROM THEDRY KPD PREPARATION FOLLOWING CULTURING OF CL. BOTULINUMOF THE A, B, C AND E TYPES.
AD-629 617 FLD. 6/13

IDENTIFICATION
TRANSLATION OF RUSSIAN RESEARCH: APPLICATION OFANTIBOTULINUM ALIZARIN SUSPENSION AGGLUTININS FOR THERAPID DETECTION OF THE TOBULISM CAUSATIVE AGENT.

AD-629 620 FLD. 6/13

HEAT
DETERMINATION OF EQUIVALENCE BETWEEN RADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CUREDMEATS.
AD-629 252 FLD. 6/8

•COATINGS
SUBMARINE HULLS
PROTECTIVE COATINGS FOR DEEP SUBMERGENCE VESSELS.
AD-629 896 FLD. 11/3

TEMPERATURE CONTROL
EFFECTS OF EXTREME ULTRAVIOLET RADIATION ON THEREFLECTANCE OF THERMAL CONTROL SURFACE COATINGS.
AD-629 942 FLD. 22/2

•COBALT COMPOUNDS
BROMIDES
ANTIFERROMAGNETIC SPIN RESONANCE OF COBR2.6H2O.
AD-629 939 FLD. 20/3

•COLLOIDS
PARTICLE SIZE
DETERMINATION OF PARTICLE SIZE DISTRIBUTIONS INEMULSIONS BY LIGHT SCATTERING.
AD-629 940 FLD. 7/4

•COLOR VISION
MEASUREMENT
REPRINT: LUMINANCE, PURITY AND WAVELENGTH MATCHES OFCONTRAST COLORS.
AD-629 282 FLD. 6/16

•COMBINATORIAL ANALYSIS
EXPERIMENTAL DESIGN
MIXTURE DESIGNS FOR FOUR FACTORS.
AD-629 269 FLD. 12/1

MATRIX ALGEBRA
REPRINT: MINIMUM PARTITION OF A MATROID INTO INDEPENDENTSUBSETS.
AD-629 905 FLD. 12/2

•COMBUSTION
ABSTRACTS
THEORY OF DETONATION, THE COMBUSTION MECHANISM, AND THEPROPERTIES OF EXPLOSIVES: COMPILATION OF ABSTRACTS.
AD-629 326 FLD. 19/4

GASES
TRANSLATION OF RUSSIAN RESEARCH: ON DETONATIONCOMBUSTION OF HETEROGENEOUS SYSTEMS.
AD-629 158 FLD. 19/4

LIQUID ROCKET FUELS
HETEROGENEOUS COMBUSTIONS AND FLAMES STRUCTURES.
AD-629 013 FLD. 21/2

OSCILLATION
INTENTIONAL COMBUSTION OSCILLATIONS IN PROPULSION SYSTEMS.
AD-629 499 FLD. 21/8

POWDERS
TRANSLATION OF RUSSIAN RESEARCH: TOWARD A THEORY OFSTABILITY OF POWDER COMBUSTION.
AD-629 059 FLD. 21/2

PRESSURE
RESPONSE OF A BURNING SOLID PROPELLANT TO PRESSURE WAVESOF FINITE AMPLITUDE.
AD-629 949 FLD. 21/9

SUPERSONIC FLOW
TRANSLATION OF RUSSIAN RESEARCH: FLOW OF A NON-ADIABATICSUPERSONIC FLOW OF AN IDEAL GAS AROUND A FLAT PLATE.
AD-629 061 FLD. 21/2

•COMBUSTION CHAMBERS
THEORY
TRANSLATION OF RUSSIAN RESEARCH: BASES OF BURNERTHEORY FOR LIQUID FUEL WITH GAS GENERATOR.
AD-629 919 FLD. 21/2

•COMBUSTION PRODUCTS
THERMODYNAMICS
THERMODYNAMIC PROPERTIES OF PROPELLANT COMBUSTIONPRODUCTS.
AD-629 099 FLD. 21/2

•COMMUNICATION EQUIPMENT
MULTIPLEX
MULTIPLEXER SET AN/FCC-17( ) AND MULTIPLEXER SETAN/MCC-12.
AD-629 549 FLD. 9/5

•COMMUNICATION SATELLITES(ACTIVE)
ECONOMICS
ECONOMIC PROBLEMS OF ESTABLISHING A COMMUNICATIONSSATELLITE SYSTEM.
AD-629 391 FLD. 5/3

•COMMUNICATION SYSTEMS
RELIABILITY(ELECTRONICS)
REPRINT: A NOTE ON THE RELIABILITY OF COMMUNICATION NETWORKS.
AD-629 692 FLD. 14/4

•COMMUNICATION THEORY
HARMONIC ANALYZERS
TRANSLATION OF RUSSIAN PATENT: DEVICE FOR THE ANALYSIS OFTHE INSTANTANEOUS SPECTRUM OF A VOICE SIGNAL IN HARMONICDECODERS.
AD-629 197 FLD. 20/1

•COMPLEMENT
HEMOLYSIS
REPRINT: ANTIBODY-COMPLEMENT COMPLEXES.
AD-629 873 FLD. 6/13

•COMPLEX COMPOUNDS
SPECTRA(INFRARED)
REPRINT: INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARY ARSINE OXIDES.
AD-629 696 FLD. 7/4

SYNTHESIS(CHEMISTRY)
TRANSITION-METAL CARBON CHEMISTRY: USE OF HEXAFLUOROBUT2-YNE FOR THE PREPARATION OF INORGANIC COMPLEX COMPOUNDS.
AD-629 988 FLD. 7/2

•COMPRESSIBLE FLOW
OSCILLATION
TRANSLATION OF RUSSIAN RESEARCH: FORCED OSCILLATIONS OF ASTREAM OF AN IDEAL COMPRESSIBLE LIQUID IN A HOMOGENEOUSSTRAIGHT PIPE.
AD-629 060 FLD. 20/4

•COMPRESSIVE PROPERTIES
FOUNDATIONS(STRUCTURES)
REPRINT: CONSOLIDATION DUE TO TANGENTIAL LOADS.
AD-629 113 FLD. 13/13

MAGNETIC PROPERTIES
EFFECTS OF PRESSURE ON MAGNETIC INTERACT-IONS.
AD-629 986 FLD. 20/3

•COMPRESSORS
FEASIBILITY STUDIES
COMPARISON OF TRANSIENT COMPRESSORS FOR THE PRODUCTION OFHIGH TEMPERATURE AND HIGH DENSITY GASES.
AD-629 970 FLD. 7/1

•COMPUTATIONAL LINGUISTICS
DATA PROCESSING SYSTEMS
RELATIONAL DATA FILE: A TOOL FOR MECHANIZED INFERENCEEXECUTION AND DATA RETRIEVAL.
AD-629 909 FLD. 9/2

STATE-OF-THEART REVIEWS
NATURAL-LANGUAGE PROCESSING BY COMPUTERS: STATE OF THEART BY 1966.
AD-629 008 FLD. 9/7

•COMPUTER STORAGE DEVICES
SELECTION
METHOD OF PIERCING THE SELECTING MATRIX OF A MEMORY:TRANSLATION OF RUSSIAN PATENT.
AD-629 288 FLD. 9/2

STATE-OF-THE-ART REVIEWS
EXTERNAL STORAGE FOR COMPUTERS: TRANSLATION OFRUSSIAN PAPER.
AD-629 295 FLD. 9/2

•COMPUTERS
EDUCATION
COMPUTERS IN SYSTEMS OF HIGHER EDUCATION.
AD-629 937 FLD. 5/9

PERSONNEL MANAGEMENT
COMPUTER SIMULATION OF ROLE CONFLICT RESOLUTION.
AD-629 991 FLD. 5/9

SOCIAL SCIENCES
REPRINT: COMPUTER PROCESSING AND CULTURAL DATA: PROBLEMSOF METHODS.
AD-629 369 FLD. 9/2

•CONDENSATION
AIR
OBSERVED SUPERSATURATION IN THE ARL 20-INCH HYPERSONICWIND TUNNEL.
AD-629 293 FLD. 14/2

•CONDENSATION REACTIONS
KETONES
REPRINT: TETRASODIO BIS-BETA-DIKETONES. DICONDENSATIONSWITH ELECTROPHILIC COMPOUNDS.
AD-629 635 FLD. 7/3

•CONDITIONED REFLEX
LEARNING
RESPONSE DURATION AND INTERRESPONSE TIME UNDER FR-9AND VR9 SCHEDULES AND SUBSEQUENT EXTINCTION.
AD-629 329 FLD. 5/10

NOISE
REPRINT: BAR PRESSING BY THE RAT AS A FUNCTION OF AUDITORYSTIMULATION.
AD-629 102 FLD. 5/10

•CONFORMAL MAPPING
NUMERICAL METHODS + PROCEDURES
TRANSLATION OF UKRAINIAN RESEARCH: A METHOD OF APPROXIMATE CONFORMAL MAPPING OF POLYGONAL REGIONS ONTO AUNIT CIRCLE.
AD-629 309 FLD. 12/1

•CONSTRUCTION
COSTS
POTENTIAL OF MASS PRODUCTION FOR REDUCING COSTS IN SHELTERCONSTRUCTION, A PRELIMINARY SURVEY.
AD-629 238 FLD. 13/13

•CONTEXT FREE GRAMMARS
ANALYSIS
DETERMINISTIC CONTEXT-FREE LANGUAGES.

AD-629 938 FLD. 9/2

ENGLISH LANGUAGE
ESTABLISHMENT OF FAILURE OF CONJECTURE THAT THE ENGLISHLANGUAGE IS NOT CONTEXT FREE.
AD-629 939 FLD. 9/2

•CONVECTION(HEAT TRANSFER)
FLUID FLOW
REPRINT: STABILITY OF A HOMOGENEOUS FLUID COOLED UNIFORMLYFROM ABOVE.
AD-629 984 FLD. 20/9

TURBINE PARTS
TRANSLATION OF UKRANIAN RESEARCH: FREE HEAT CONVECTIONIN TURBINE CLEARANCE.
AD-629 269 FLD. 10/1

•CONVERTIBLE PLANES
HANDLING
ANALYTICAL STUDY OF V/STOL HANDLING QUALITIES IN HOVER ANDTRANSITION.
AD-629 999 FLD. 1/2

•CONVEX SETS
GRAPHICS
REPRINT: MAXIMUM MATCHING AND A POLYHEDRON WITHO,1-VERTICES.
AD-629 907 FLD. 12/2

•CONVULSIVE DISORDERS
OXYGEN
REPRINT: BRAIN LESIONS AND HYPERBARIC OXYGEN CONVULSIONS.
AD-629 927 FLD. 6/5

•COOLING
EVAPOTRANSPIRATION
REPRINT: TRANSPIRATION COOLING WITH CHEMICAL REACTIONS.
AD-629 367 FLD. 20/13

•COOLING FANS
AXIAL-FLOW FANS
DEVELOPMENT OF MINIATURE COOLING DEVICE IN ACCORDANCEWITH BUREAU OF SHIPS.
AD-629 190 FLD. 13/1

•COOLING + VENTILATING EQUIPMENT
CONTAMINATION
CONTAMINATION OF A LABORATORY BUILDING BY AIR FILTERS.
AD-629 306 FLD. 14/2

FALLOUT SHELTERS
STUDY AND EVALUATION OF ABSORPTION-BASED COOLING SYSTEMSFOR USE IN CIVIL DEFENSE SHELTERS.
AD-629 436 FLD. 13/1

•COOLING + VENTILATION EQUIPMENT
THERMOCOUPLES
TRANSLATION OF RUSSIAN RESEARCH: THERMOELECTRICCOOLING AND ITS PRACTICAL APPLICATION.
AD-629 292 FLD. 13/1

•COPOLYMERIZATION
CATALYSTS
REPRINT: COMPARISON OF CATALYTIC SYSTEMS FOR THEIONIC COPOLYMERIZATION OF STYRENE AND P-METHYLSTYRENE.
AD-629 991 FLD. 11/9

•COPPER
OPTICAL PROPERTIES
OPTICAL PROPERTIES OF COPPER NICKEL, AND A SERIES OFCOPPER-NICKEL ALLOYS.
AD-629 971 FLD. 11/6

SOLUBILITY
TRANSLATION OF RUSSIAN RESEARCH: MUTUAL SOLUBILITY OFCOPPER AND MOLYBDENUM AND CERTAIN PROPERTIES OF ALLOYS OFMOLYBDENUM WITH COPPER.
AD-629 908 FLD. 11/6

•COPPER ALLOYS
STRESS CORROSION
REPRINT: MECHANISMS OF TRANSGRANULAR STRESS CORROSIONCRACKING OF SOLID SOLUTION ALLOYS.
AD-629 954 FLD. 11/6

•COSMIC RAYS
NEUTRON SPECTRUM
REPRINT: NEUTRON MONITOR MASS ABSORPTION COEFFICIENTSAT CHICAGO AND CLIMAX DURING SOLAR CYCLE 19 (1954-1963).
AD-629 600 FLD. 4/1

•COSTS
UNCERTAINTY
COMPUTERIZED TECHNIQUE TO EXPRESS UNCERTAINTY IN ADVANCEDSYSTEM COST ESTIMATES.
AD-629 899 FLD. 5/3

•CRATERING
GRAVITY
INVESTIGATION OF THE EFFECTS OF GRAVITY ON CRATER FORMATIONIN A COHESIONLESS MEDIUM.
AD-629 391 FLD. 19/4

•CROSSED FIELD DEVICES
PERFORMANCE(ENGINEERING)
RESEARCH ON CROSSED-FIELD ELECTRON DEVICES.
AD-629 438 FLD. 9/1

•CRYOGENICS
CHEMICAL REACTIONS
STUDIES OF LOW-TEMPERATURE OXIDATION REACTIONS.
AD-629 307 FLD. 7/2

•CRYSTAL FILTERS
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE CRYSTAL UNIT CR-(XM-96A)/U.
AD-629 202 FLD. 9/1

QUARTZ
REPRINT: SECONDARY WAVE ELIMINATION IN THICKNESS-SHEARVIBRATION QUARTZ PLATE FRO FREQUENCY 5-100 MHZ: TESTIN GERMAN.
AD-629 999 FLD. 9/5

•CRYSTAL LATTICE DEFECTS
GOLD
REPRINT: NONEQUILIBRIUM SITUATIONS INVOLVING VACANCIESIN GOLD.
AD-629 877 FLD. 20/2

LUMINESCENCE
EFFECTS OF EXPERIMENTAL PARAMETERS ON THERMOLUMINESCENCEOF A TYPE II-A DIAMOND.
AD-629 169 FLD. 20/12

MAGNESIUM COMPOUNDS
REPRINT: POINT DEFECTS IN MAGNESIUM OXIDE.
AD-629 550 FLD. 20/12

METALS
DISLOCATION DYNAMICS IN METALS AND THE INFLUENCE OF DISLOCATION DISTRIBUTION ON LOW TEMPERATURE ELECTRICAL TRANSPORT PROPERTIES.
AD-629 029 FLD. 20/2

•CRYSTAL STRUCTURE
BIBLIOGRAPHIES
BIBLIOGRAPHY OF RUSSIAN RESEARCH: STRUCTURE OF ORGANICCIYSTALS.
AD-629 079 FLD. 20/2

INTEGRALS
DIFFERENT BANDS FOR DIFFERENT SPINS: COHESIVE ENERGY OFALKALI METALS; LINEAR CHAIN OF HYDROGEN ATOMS. CRYSTALINTEGRALS AND MOLECULAR INTEGRALS.
AD-629 911 FLD. 7/4

METALORGANIC COMPOUNDS
REPRINT: CRYSTAL AND MOLECULAR STRUCTURE OF PENTAKIS(METHYLISONITRILE)COBALT(1) PERCHLORATE.
AD-629 639 FLD. 7/4
REPRINT: CRYSTAL STRUCTURE OF TETRAMERIC COBALT(II)ACETYLACETONATE .
AD-629 643 FLD. 7/4

•CRYSTALLOGRAPHY
REPORTS
ENGINEERING AND APPLIED PHYSICS RESEARCH PROGRESSREPORT NO. 2, SEPTEMBER 1, 1964-SEPTEMBER 1, 1965.
AD-629 421 FLD. 20/2

•CRYSTALS
LIGHT TRANSMISSION
TRANSLATION OF RUSSIAN RESEARCH: ON THE THEORY OF THECONVERSION OF THE FREQUENCY OF LIGHT WAVES BY A CRYSTAL.
AD-629 311 FLD. 20/6

LUMINESCENCE
REPRINT: APPARATUS FOR MEASUREMENT OF THE LUMINESCENCESPECTRA OF CRYSTALS AT N.R.C. OTTAWA.
AD-629 959 FLD. 14/2

•CULTURE
COMPUTERS
REPRINT: COMPUTER PROCESSING AND CULTURAL DATA: PROBLEMSOF METHODS.
AD-629 369 FLD. 9/2

•CYCLOBUTANES
SYNTHESIS(CHEMISTRY)
PHOTOCHEMICAL SYNTHESIS OF POLYAZACYCLOBUTANE SYSTEMS.
AD-629 218 FLD. 7/3

•CYCLOPROPANES
STABILITY
FACTORS INVOLVED IN THE STABILITY OF CYCLOPROPANES.
AD-629 080 FLD. 7/3

•CYCLOTRON RESONANCE PHENOMENA
BANDWIDTH
TRANSLATION OF RUSSIAN RESEARCH: WIDTH OF COMBINEDRESONANCE BANDS.
AD-629 302 FLD. 7/4

•CYLINDRICAL BODIES
FLUID DYNAMIC PROPERTIES
REPRINT: EFFECT OF A CYLINDRICAL BOUNDARY ON THE ADDEDMASS OF TWO CYLINDERS IN LIQUID HELIUM.
AD-629 696 FLD. 20/4

HYPERSONIC FLOW
EXPERIMENTAL INVESTIGATIONS OF HYPERSONIC FLOW AROUNDTWO-DIMENSIONAL CIRCULAR CYLINDERS.
AD-629 384 FLD. 20/4

LOADING(MECHANICS)
SNAP-THROUGH AND POSTBUCKLING-EQUILIBRIUM BEHAVIOR OFCIRCULAR CYLINDRICAL SHELLS UNDER AXIAL LOAD.
AD-629 275 FLD. 20/11
ELASTIC-PLASTIC ANALYSIS OF THE COLLAPSE OF UNIFORMLYCOMPRESSED CIRCULAR CYLINDRICAL SHELLS.
AD-629 276 FLD. 20/11

MOTION
TRANSLATION OF RUSSIAN RESEARCH: OSCILLATIONS AND STABILITYOF A TRIPLE LAYER CYLINDRICAL SHELL WITH INCOMPRESSIBLEIDEAL LIQUID.
AD-629 297 FLD. 20/11

•CYTOCHEMISTRY
FUNGI
CYTOCHEMISTRY AND BIOCHEMISTRY OF THE FUNGUS PARACOCCIDOIDESBRASILIENSIS.
AD-629 973 FLD. 6/1

•CYTOPLASM
TRANSPORT PROPERTIES
REPRINT: THE MEMBRANE THEORY AND OTHER VIEWS FOR SOLUTEPERMEABILITY, DISTRIBUTION, AND TRANSPORT IN LIVING CELLS.
AD-629 871 FLD. 6/3

•DAMS
SOIL MECHANICS
LABORATORY STUDIES ON THE EFFECTS OF LABORATORY SIMULATEDEARTHQUAKE LOADINGS ON COHESIVE SOIL STRENGTH, SAN LUIS DAMAND CANAL--SAN LUIS UNIT CENTRAL VALLEY PROJECT, CALIFORNIA.
AD-629 993 FLD. 8/13

WATER SUPPLIES
INDEPENDENCE OF YEARLY WATER INPUTS IN DAMS.
AD-629 898 FLD. 8/8

•DATA PROCESSING SYSTEMS
SEISMOLOGY
SEISMOLOGY: ANALYSIS OF VARIANCE AS A METHOD OF AUTOMATICSIGNAL DETECTION.
AD-629 949 FLD. 8/11
SEISMOLOGY: APPLICATION OF PARTIAL COHERENCY TECHNIQUESTO THE PROBLEM OF PROCESSING SEISMIC DATA.
AD-629 947 FLD. 8/11

SYMPOSIA
COMPUTER-CENTERED DATA BASE SYSTEMS: PROCEEDINGS OFSECOND SYMPOSIUM.
AD-629 917 FLD. 9/2

•DATA STORAGE SYSTEMS
MAGNETIC CORES
TRANSLATION OF RUSSIAN PATENT: METHOD OF COLLECTINGINFORMATION IN A LONG TERM MEMORY DEVICE.
AD-629 290 FLD. 9/2

OPERATION
QUEUEING MODELS FOR FILE MEMORY OPERATION.
AD-629 993 FLD. 9/2

•DECAY SCHEMES
IRON
REPRINT: FE59(N,P), (N,ALPHA), AND (N,2N) CROSS SECTIONS.
AD-629 980 FLD. 20/8

•DECISION MAKING
ANALYSIS
CONFLICT AND ITS RESOLUTION.
AD-629 918 FLD. 5/10

BEHAVIOR
SOCIAL MOTIVES AND DECISION-MAKING BEHAVIOR IN INTERPERSONAL SITUATIONS.
AD-629 987 FLD. 5/10

MANAGEMENT PLANNING
SYSTEM COST ANALYSIS: A MANAGEMENT TOOL FOR DECISIONMAKING.
AD-629 893 FLD. 5/3

SEQUENTIAL ANALYSIS
TIMELINESS AND ACCURACY IN A SEQUENTIAL DECISION MAKINGTASK.
AD-629 229 FLD. 5/9

TESTS
REPRINT: SEEKING INFORMATION TO REDUCE THE RISK OFDECISIONS.
AD-629 942 FLD. 5/10

•DECISION THEORY
PERSONNEL MANAGEMENT
DECISION THEORY AS APPLIED TO PERSONNEL CLASSIFICATION ANDEVALUATION.
AD-629 009 FLD. 5/9

SEQUENTIAL ANALYSIS
GENERAL THEORY OF FINITE SEQUENTIAL DECISION PROCESSES.
AD-629 048 FLD. 12/1

•DEFENSE SYSTEMS
UNITED STATES
SURVEY OF WEAPONS AND HAZARDS WHICH MAY FACE THEUNITED STATES PEOPLE IN WARTIME.
AD-629 251 FLD. 15/3

•DEFORMATION
ELASTIC SHELLS
FINITE DEFORMATIONS UNDER PRESSURIZATION IN AN INFINITELYLONG, THICK-WALLED, NONLINEARLY VISCOELASTIC CYLINDERIDEALLY BONDED TO A THIN ELASTIC CASE.
AD-629 219 FLD. 20/11

METALS
METALWORKING PROCESSES AND EQUIPMENT.
AD-629 049 FLD. 13/8

•DEGRADATION
COATINGS
EFFECTS OF EXTREME ULTRAVIOLET RADIATION ON THEREFLECTANCE OF THERMAL CONTROL SURFACE COATINGS.
AD-629 992 FLD. 22/2

•DEHYDRATED FOODS
COMPRESSIVE PROPERTIES
OBJECTIVE TESTS FOR USE IN THE TECHNOLOGY OF COMPRESSEDFOODS.
AD-629 869 FLD. 6/8

STORAGE
EFFECT OF EXPOSURE TO OXYGEN ON CHANGES IN MEATS ANDVEGETABLES DURING STORAGE.
AD-629 989 FLD. 6/8

•DELTA WINGS
AERODYNAMIC LOADING
CALCULATION OF THE FORCE COEFFICIENT FOR DELTA WINGS INHYPERSONIC FLOW.
AD-629 909 FLD. 20/9

•DEMODULATORS
AMPLITUDE MODULATION
TRANSLATION OF RUSSIAN PATENT: METHOD OF SPEATING ONEAMPLITUDE-MODULATED SIGNAL FROM TWO MIXED AM SIGNALSWITH SUPERPOSED SPECTRA, BUT DIFFERENT CARRIERS.
AD-629 072 FLD. 9/5

LIGHT COMMUNICATION SYSTEMS
MICROWAVE OPTICAL RECEIVER TECHNIQUES.
AD-629 382 FLD. 17/2

•DEPARTMENT OF DEFENSE
SCIENTIFIC RESEARCH
SCIENTIFIC JOURNALS: AVAILABILITY OF RESEARCH SPONSOREDBY OFFICE OF AEROSPACE RESEARCH.
AD-629 509 FLD. 5/2

•DETECTION
MILITARY FACILITIES
REPRINT: MINIMAX DETECTION STATION PLACEMENT.
AD-629 139 FLD. 19/7

•DETERGENTS
VISCOSITY
SURFACE VISCOSITY OF DETERGENT SOLUTIONS AS A FACTOR INFOAM STABILITY.
AD-629 946 FLD. 11/11

•DETONATION WAVES
CHEMICAL REACTIONS
TRANSLATION OF RUSSIAN RESEARCH: CONTRIBUTION TO THEPROBLEM OF ESTIMATING THE LENGTH OF THE CHEMICAL REACTIONZONE BEHIND THE FRONT OF A DETONATION WAVE.
AD-629 974 FLD. 19/9

EQUATIONS OF STATE
TRANSLATION OF RUSSIAN RESEARCH: CALCULATION OFCOMPOSITION OF EXPLOSIVES AND DETONATION PARAMETERSOF CONDENSED EXPLOSIVES.
AD-629 190 FLD. 19/1

GASES
FORMATION OF DETONATION WAVES IN COMBUSTIBLE GASEOUSMIXTURES.
AD-629 989 FLD. 19/9

MEASUREMENT
TRANSLATION OF RUSSIAN RESEARCH: IMPROVEMENT OF METHODSFOR MEASURING DETONATION RATES.
AD-629 609 FLD. 19/2

•DETONATIONS
ABSTRACTS
THEORY OF DETONATION, THE COMBUSTION MECHANISM, AND THEPROPERTIES OF EXPLOSIVES: COMPILATION OF ABSTRACTS.
AD-629 326 FLD. 19/9

GASES
TRANSLATION OF RUSSIAN RESEARCH: ON DETONATIONCOMBUSTION OF HETEROGENEOUS SYSTEMS.
AD-629 158 FLD. 19/9

•DEUTERIUM
OCEANOGRAPHIC DATA
REPRINT: ISOTOPIC OCEANOGRAPHY: DEUTERIUM AND OXYGEN18 VARIATIONS IN THE OCEAN AND THE MARINE ATMOSPHERE.
AD-629 490 FLD. 8/10

•DEXTRAN
MOLECULAR STRUCTURE
REPRINT: SEMIQUANTITATIVE ASPECT OF SHORT BRANCHDETECTION BY USING POLYELECTROLYTE EXPANSIVE EFFECTS.
AD-629 929 FLD. 7/9

•DIAMONDS
CRYSTAL LATTICE DEFECTS
EFFECTS OF EXPERIMENTAL PARAMETERS ON THERMOLUMINESCENCEOF A TYPE II-A DIAMOND.
AD-629 169 FLD. 20/12

•DIELECTRIC FILMS
LEAD COMPOUNDS
REPRINT: EVAPORATED DIELECTRIC FILM FOR DETERMINING THEOPTICAL CONSTANTS OF A METAL.
AD-629 999 FLD. 20/6

•DIELECTRIC PROPERTIES
CRYSTALS
REPRINT: LINEAR DIELECTRIC PROPERTIES OF FINITE IONICCRYSTALS.
AD-629 961 FLD. 20/2

•DIFFERENTIAL EQUATIONS
ASYMPTOTIC SERIES
REPRINT: ESSENTIALLY POSITIVE

SYSTEMS OF LINEAR DIFFERENTIALEQUATIONS.
AD-629 876 FLD. 12/1

ATMOSPHERE MODELS
INITIALIZATION OF PRIMITIVE-EQUATION MODELS FOR NUMERICALWEATHER PREDICTION.
AD-629 398 FLD. 4/2

COMPLEX VARIABLES
REPRINT: RICCATI EQUATION AND REGGE POLES.
AD-629 355 FLD. 12/1

ELASTICITY
TRANSLATION OF UKRAINIAN RESEARCH: DIFFERENTIAL EQUATIONSOF ELASTIC EQUILIBRIUM OF SHELLS OF ROTATION WITH MERIDIONALRIBS AT POWER AND TEMPERATURE LOADS.
AD-629 162 FLD. 20/11

•DIFFRACTION
MICROWAVES
REPRINT: MICROWAVE MEASUREMENTS OF PARTIALLY COHERENTFIELDS.
AD-629 128 FLD. 20/14

•DIFFUSERS
DESIGN
REPRINT: CHAMBER FOR CONTINUOUS MIXING OF HIGH PRESSURECOMBUSTIBLE GASES.
AD-629 965 FLD. 14/2

•DIGITAL DIFFERENTIAL ANALYZERS
PROGRAMMING(COMPUTERS)
REPRINT: SCALING OF DIGITAL DIFFERENTIAL ANALYZERS.
AD-629 021 FLD. 9/2

•DILATOMETERS
OPERATION
REPRINT: SOME CHEMICAL APPLICATIONS OF THERMODILATOMETRICANALYSIS.
AD-629 989 FLD. 7/4

•DIODES
ELECTRODES
EFFECT OF SIMULATED FISSION PRODUCTS IN THE INTER-ELECTRODESPACING OF A THERMIONIC DIODE.
AD-629 586 FLD. 18/10

•DIODES(SEMICONDUCTOR)
MAGNETIC PROPERTIES
REPRINT: MAGNETIC PROPERTIES OF INAS DIODE ELECTROLUMINESCENCE.
AD-629 878 FLD. 20/3

POWER AMPLIFIERS
HIGH SPEED POWER AMPLIFIER USING AN ELECTRON SWITCHEDP-N JUNCTION.
AD-629 920 FLD. 9/5

RECTIFIERS
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICONRECTIFIER STACKS.
AD-629 925 FLD. 9/1

STRESSES
REPRINT: APPARATUS FOR APPLYING UNIAXIAL PRESSURE AT VERYLOW TEMPERATURES.
AD-629 020 FLD. 14/2

•DIRECTION FINDING
RADIO TRANSMISSION
A STUDY OF HIGH-FREQUENCY DIRECTIONAL PROPAGATION OVER A950 KILOMETER EAST-TO-WEST PATH. PART I. DESCRIPTION OFTHE DIRECTIONAL PROPAGATION EXPERIMENT (THE COLUMBUSEXPERIMENT). PART II. AN ATLAS OF REDUCED DATA.
AD-629 913 FLD. 17/3

•DISCRIMINATORS
AMPLITUDE MODULATION
TRANSLATION OF RUSSIAN PATENT: METHOD OF SPEATING ONEAMPLITUDE-MODULATED SIGNAL FROM TWO MIXED AM SIGNALSWITH SUPERPOSED SPECTRA, BUT DIFFERENT CARRIERS.
AD-629 072 FLD. 9/5

•DISEASE VECTORS
INDEXES
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN,CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE,VOLUME 4, NO. 12.
AD-629 274 FLD. 6/3

PASTEURELLA
TRANSLATION OF RUSSIAN RESEARCH: NEW VARIETY OF PLAGUEMICROBE.
AD-629 630 FLD. 6/13
TRANSLATION OF RUSSIAN RESEARCH: NATURAL TULAREMIA FOCION THE TERRITORY OF THE UKRAINIAN SSR.
AD-629 697 FLD. 6/13

TICKS
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL ANALYSISOF THE IMPORTANCE OF THE DIFFERENT PHASES IN THEMETAMORPHOSIS OF ORNITHODOROS PAPILLIPES IN THETRANSMISSION OF THE SPIROCHAETES OF TICK-BORNERELAPSING FEVER.
AD-629 633 FLD. 6/3

VIRUS DISEASES
INDEX CATALOGUE TO RUSSIAN, CENTRAL AND EASTERN EUROPEAN,AND CHINESE LITERATURE IN MEDICAL ENTOMOLOGY. VOLUME 9.VIRAL DISEASES.
AD-629 100 FLD. 6/3
TRANSLATION OF RUSSIAN RESEARCH: OMSK HEMORRHAGICFEVER INCIDENCE IN MAN AND MUSKRATS IN WINTER.
AD-629 697 FLD. 6/13

•DISKS
FLUID DYNAMIC PROPERTIES
TRANSLATION OF RUSSION RESEARCH: HYDRODYNAMICRESISTANCE AND HEAT TRANSFER OF A HOUSED DISK WITHRADIAL FLOW IN THE GAP.
AD-629 187 FLD. 20/4

•DISPLAY SYSTEMS
COLORS
ADVANCED DYNAMIC ATTRIBUTE EXTRACTION TECHNIQUES.
AD-629 181 FLD. 9/2

•DISSOCIATION
PRESSURE
REPRINT: EFFECT OF PRESSURE ON THE DISSOCIATION OFMANGANESE SULFATE ION PAIRS IN WATER.
AD-629 989 FLD. 7/4

•DOCUMENTATION
LIBRARIES
LIST OF ACRONYMS AND ABBREVIATIONS USED IN THE MCDONNELLAIRCRAFT TECHNICAL LIBRARY.
AD-629 208 FLD. 5/2

SYMPOSIA
INTERNATIONAL FEDERATION FOR DOCUMENTATION (FID):ABSTRACTS OF PAPERS FOR PRESENTATION AT WASHINGTON,D. C., OCT 1969.
AD-629 998 FLD. 5/2

UNITED STATES GOVERNMENT
REPRINT: PROPOSAL FOR ESTABLISHMENT OF A NATIONALTECHNICAL INFORMATION SYSTEM.
AD-629 996 FLD. 5/2

•DOSE RATE
BETA PARTICLES
DISINTEGRATION RATE MULTIPLIERS IN BETA-EMITTER DOSECALCULATIONS.
AD-629 359 FLD. 6/18

•DROPS
ATMOSPHERIC PRECIPITATION
ION FRACTIONATION IN DROPS FROM BREAKING BUBBLES.
AD-629 179 FLD. 7/4

WATER
REPRINT: SCATTERING PROPERTIES OF CONCENTRIC SOOT-WATERSPHERES FOR VISIBLE AND INFRARED LIGHT.
AD-629 992 FLD. 20/6

•DRUGS
HYPOTHERMIA
REPRINT: THE EFFECT OF TOLBUTAMIDE (RASTINON) ON THELEVELS OF GLUCOSE AND INORGANIC PHOSPHORUS OF BLOOD INNORMOTHERMIC AND HYPOTHERMIC RATS.
AD-629 508 FLD. 6/15

•DUCT INLETS
HYPERSONIC FLOW
MEASUREMENT OF THE HEAT TRANSFER TO A TWO-DIMENSIONALHYPERSONIC INLET WITH VARIABLE GEOMETRY.
AD-629 095 FLD. 20/13

•EARTH(PLANET)
DENSITY
REPRINT: FREE VIBRATIONS OF THE EARTH AND THE PROPERTIESOF ITS DEEP INTERIOR REGIONS. PART I. DENSITY.
AD-629 208 FLD. 8/7

•EARTHQUAKES
MISSOURI
LONG RANGE SEISMIC MEASUREMENTS OF NEW MADRID,MISSOURI EARTHQUAKE.
AD-629 399 FLD. 8/11

•ECONOMICS
CHINA
RATE AND PATTERN OF INDUSTRIAL GROWTH IN COMMUNIST CHINA.
AD-629 902 FLD. 5/3

COMMUNICATION SATELLITES(ACTIVE)
ECONOMIC PROBLEMS OF ESTABLISHING A COMMUNICATIONSSATELLITE SYSTEM.
AD-629 391 FLD. 5/3

DECISION THEORY
APPLICATION OF CHANCE-CONSTRAINED PROGRAMMING TOSOLUTION OF THE SO-CALLED 'SAVINGS AND LOAN ASSOCIATION'TYPE OF PROBLEM.
AD-629 090 FLD. 12/2

•EDUCATION
COMPUTERS
COMPUTERS IN SYSTEMS OF HIGHER EDUCATION.
AD-629 937 FLD. 9/9

MAN-MACHINE SYSTEMS
DESIGN OF MAN-MACHINE SYSTEMS IN EDUCATION.
AD-629 942 FLD. 5/9

•ELASTIC SCATTERING
ELECTRONS
ELASTIC SCATTERING OF LOW ENERGY ELECTRONS FROM ATOMICHELIUM.
AD-629 519 FLD. 20/8

•ELASTIC SHELLS
BENDING
TRANSLATION OF RUSSIAN RESEARCH: APPROXIMATE SOLUTIONOF THE PROBLEM OF BENDING OF A SHALLOW SPHERICAL SHELLWEAKENED BY AN APERTURE.
AD-629 192 FLD. 20/11

BODIES OF REVOLUTION
TRANSLATION OF UKRAINIAN RESEARCH: DIFFERENTIAL EQUATIONSOF ELASTIC EQUILIBRIUM OF SHELLS OF ROTATION WITH MERIDIONALRIBS AT POWER AND TEMPERATURE LOADS.
AD-629 142 FLD. 20/11

•ELASTICITY
SOLID STATE PHYSICS
REPRINT: CHARACTERISTIC FREQUENCIES FROM INFRARED ANDELASTIC DATA.
AD-629 166 FLD. 20/12

•ELASTOMERS
PREPARATION
SYNTHESIS OF UNSATURATED FLUOROCARBON COMPOUNDS FOR USEIN ELASTOMERS.
AD-629 867 FLD. 11/10
SYNTHESIS OF AMINOQUINONE POLYMERS FOR USE AS HEATRESISTANT ELASTOMERS.
AD-629 891 FLD. 11/10

SYNTHESIS(CHEMISTRY)
TRANSLATION OF RUSSIAN RESEARCH: REACTION OFORGANOCYCLOSILAZANE WITH DIHYDROXY POLYORGANOSILOXANES.
AD-629 094 FLD. 11/10

•ELECTRIC ARCS
HEATING
ARC HEATING IN A TUBE.
AD-629 958 FLD. 20/9

•ELECTRIC POWER PRODUCTION
AUTOMATION
TRANSLATION OF RUSSIAN RESEARCH: AUTOMATIC CONTROL OFPOWER OF HYDROELECTRIC STATIONS BY CURRENT FLOW.
AD-629 183 FLD. 10/2

MAGNETOHYDRODYNAMIC GENERATORS
POWER GENERATION THROUGH THE INTERACTION OF PLASMA FLOWSAND MAGNETIC FIELDS.
AD-629 979 FLD. 10/2

•ELECTRIC PROPULSION
SPACECRAFT
TRANSLATION OF RUSSIAN ARTICLE: EXTRATERRESTRIAL FUELSUPPLIES FOR ELECTRICAL PROPULSION VEHICLES.
AD-629 142 FLD. 21/3

•ELECTRICAL CONDUCTANCE
PLASMA MEDIUM
REPRINT: DIFFUSION AND CONDUCTIVITY OF PLASMAS IN STRONGEXTERNAL FIELDS.
AD-629 998 FLD. 20/9

•ELECTRICAL NETWORKS
COMMUNICATION SYSTEMS
SET OF CUT SETS AND OPTIMUM FLOW.
AD-629 200 FLD. 9/1

MATHEMATICAL ANALYSIS
STEADY-STATE AND TRANSIENT RESPONSE OF ARBITRARY TAPEREDDISTRIBUTED RC NETWORKS WITH LUMPED LOAD TERMINATIONS.
AD-629 392 FLD. 9/5

•ELECTRICAL PROPERTIES
MEMBRANES
ELECTRICAL PROPERTIES OF SEMIPERMEABLE MEMBRANES.
AD-629 970 FLD. 7/4

•ELECTROLUMINESCENCE
DIODES(SEMICONDUCTOR)
REPRINT: MAGNETIC PROPERTIES OF INAS DIODE ELECTROLUMINESCENCE.
AD-629 878 FLD. 20/3

•ELECTROLYTES
INORGANIC POLYMERS
GLASS TRANSITION IN IONIC PHOSPHATE POLYMERS.
AD-629 330 FLD. 11/9
VISCOELASTIC RELAXATION MECHANISMS OF INORGANICPOLYMERS: COUNTERION EFFECTS IN BULK PHOSPHATEPOLYELECTROLYTES.
AD-629 331 FLD. 11/9

POLYMERS
REPRINT: SEMIQUANTITATIVE ASPECT OF SHORT BRANCHDETECTION BY USING POLYELECTROLYTE EXPANSIVE EFFECTS.
AD-629 524 FLD. 7/4

•ELECTROMAGNETIC COMPATIBILITY
COMMUNICATION SYSTEMS
ASSIGNMENT OF FREQUENCIES IN THE TACTICAL COMBATENVIRONMENT.
AD-629 589 FLD. 17/2.1

•ELECTROMAGNETIC FIELDS
PLASMA PHYSICS
THEORETICAL PROBLEMS IN PLASMA PHYSICS.
AD-629 429 FLD. 20/9

SYNTHESIS
MODAL ANALYSIS AND SYNTHESIS OF ELECTROMAGNETIC FIELDS.
AD-629 362 FLD. 20/3

•ELECTROMAGNETIC PULSES
PROPAGATION
REPRINT: PROPAGATION OF PULSES IN DISPERSIVE MEDIA.
AD-629 139 FLD. 20/14

•ELECTROMAGNETIC WAVE REFLECTIONS
CONTROL
REPRINT: CONTROL OF ELECTROMAGNETIC SCATTERING BYIMPEDANCE LOADING.
AD-629 122 FLD. 20/14

RADAR TARGETS
REPRINT: A LOOK INTO THE FUTURE OF RADAR SCATTERINGRESEARCH AND DEVELOPMENT.
AD-629 164 FLD. 17/9

•ELECTROMAGNETIC WAVES
INTERFERENCE
TRANSLATION OF CHINESE RESEARCH: COHERENCE PROPERTIESOF ELECTROMAGNETIC RADIATION.
AD-629 038 FLD. 20/6

NUCLEAR EXPLOSIONS
EFFECTS OF PROPAGATION ON THE HIGH-FREQUENCY ELECTROMAGNETIC RADIATION FROM LOW-ALTITUDE NUCLEAR EXPLOSIONS.
AD-629 079 FLD. 18/3

PLASMA MEDIUM
REPRINT: ON TRANSIENT WAVE PROPAGATION IN A PLASMA.
AD-629 133 FLD. 20/14

PROPAGATION
METHOD OF SOLVING THE INTEGRAL EQUATIONS FOR THE VERTICALPROPAGATION OF TIME-HARMONIC ELECTROMAGNETIC PLANEWAVES IN ANISOTROPIC VERTICALLY-HOMOGENEOUS MEDIA.
AD-629 609 FLD. 20/14

SCATTERING
REPRINT: SCATTERING PROPERTIES OF CONCENTRIC SOOT-WATERSPHERES FOR VISIBLE AND INFRARED LIGHT.
AD-629 992 FLD. 20/6

SCIENTIFIC RESEARCH
CONSOLIDATED SEMIANNUAL PROGRESS REPORT NO. 2, 1 APRIL1969 THROUGH 30 SEPTEMBER 1969, BY ELECTRONICS SCIENCESLABORATORY, UNIVERSITY OF SOUTHERN CALIFORNIA.
AD-629 971 FLD. 20/12

•ELECTRON BEAMS
MANUFACTURING METHODS
ELECTRON BEAM TECHNIQUES FOR FABRICATION AND ASSEMBLYOF PARTS FOR ELECTRON TUBES.
AD-629 979 FLD. 13/8

•ELECTRON BOMBARDMENT
SEMICONDUCTORS
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIESIN ORGANIC AND INORGANIC MATERIALS.
AD-629 884 FLD. 20/12

•ELECTRON CAPTURE
IONS
ELECTRONIC AND IONIC COLLISION PROCESSES.
AD-629 313 FLD. 20/8

PROTONS
REPRINT: ELECTRON CAPTURE FROM ATOMIC NITROGEN ANDOXYGEN BY PROTONS.
AD-629 138 FLD. 20/8

•ELECTRON GUNS
CROSSED FIELD DEVICES
RESEARCH ON CROSSED-FIELD ELECTRON DEVICES.
AD-629 938 FLD. 9/1

•ELECTRON SPIN RESONANCE
ABSORPTION SPECTRUM
REPRINT: POINT DEFECTS IN MAGNESIUM OXIDE.
AD-629 990 FLD. 20/12

BANDWIDTH
TRANSLATION OF RUSSIAN RESEARCH: WIDTH OF COMBINEDRESONANCE BANDS.
AD-629 302 FLD. 7/4

COBALT COMPOUNDS
ANTIFERROMAGNETIC SPIN RESONANCE OF COBR2.6H2O.
AD-629 939 FLD. 20/3

•ELECTRON TRANSITIONS
ATOMIC SPECTROSCOPY
RESEARCH ON F-VALUES IN THE USSR.
AD-629 996 FLD. 7/4

PROBABILITY
REPRINT: NEW METHOD OF MEASURING TRANSITION PROBABILITIES.
AD-629 595 FLD. 7/4

•ELECTRON TUBE PARTS
MANUFACTURING METHODS
ELECTRON BEAM TECHNIQUES FOR FABRICATION AND ASSEMBLYOF PARTS FOR ELECTRON TUBES.
AD-629 979 FLD. 13/8

•ELECTRON TUBES
DEUTERIUM
HYDROGEN AND DEUTERIUM CLEANUP.
AD-629 389 FLD. 9/1

•ELECTRONIC SWITCHES
INTERCOMMUNICATION SYSTEMS
REPRINT: SEALED PRESS-TO-TALK INTERCOMMUNICATIONSSWITCH.
AD-629 922 FLD. 9/5

•ELECTRONS
EXCITATION
ONE-PARTICLE PROPERTIES OF AN INHOMOGENEOUS INTERACTINGELECTRON GAS.
AD-629 343 FLD. 7/4

THERMAL DIFFUSION
ELECTRON THERMAL DIFFUSIVITY IN RARE-GAS AFTERGLOWPLASMAS.

AD-629 082 FLD. 20/9

•ELEMENTARY PARTICLES
MASS NUMBER
REPRINT: MASS FORMULA IN THE COVARIANT SPIN-UNITARY SPINSCHEME.
AD-629 961 FLD. 20/8

PERTURBATION THEORY
REPRINT: A MODEL REQUIRING LIE GROUP SYMMETRIES.
AD-629 398 FLD. 20/8

•ENERGY CONVERSION
MATERIALS
MATERIALS FOR HIGH-TEMPERATURE ENERGY CONVERTERS: ANNOTATED BIBLIOGRAPHY BASED ON SOVIET OPEN-SOURCE MATERIALS.
AD-629 198 FLD. 10/1

•ENGINE STARTERS
GAS TURBINES
TRANSLATION OF A RUSSIAN PATENT: REMOTE STARTING DEVICESFOR GAS TURBINES.
AD-629 144 FLD. 21/5

•ENGLISH LANGUAGE
CONTEXT FREE GRAMMARS
ESTABLISHMENT OF FAILURE OF CONJECTURE THAT THE ENGLISHLANGUAGE IS NOT CONTEXT FREE.
AD-629 939 FLD. 9/2

•ENTEROBACTERIACEAE
HOSPITALS
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF THE ABILITYOF ENTERIC BACTERIA TO INFECT THE AIR OF HOSPITAL WARDS.
AD-629 628 FLD. 6/13

•ENTROPY
ICE
REPRINT: ENTROPY CHANGES AT THE PHASE TRANSITIONS IN ICE.
AD-629 979 FLD. 7/4

•ENVIRONMENTAL TESTS
AIR FORCE RESEARCH
EVOLUTION OF USAF ENVIRONMENTAL TESTING.
AD-629 949 FLD. 14/2

•ENZYME INHIBITORS
HEALING
BIOLOGICAL SIGNIFICANCE OF A PROTEASE INHIBITOR NEWLY ISOLATEDFROM ANIMAL TISSUES IN INFLAMMATION.
AD-629 889 FLD. 6/1

•EPIDEMIOLOGY
STOCHASTIC PROCESSES
REPRINT: ON THE GENERAL STOCHASTIC EPIDEMIC.
AD-629 899 FLD. 12/1

•EPOXY PLASTIC
COATINGS
PROTECTIVE COATINGS FOR DEEP SUBMERGENCE VESSELS.
AD-629 896 FLD. 11/3

•EQUATIONS OF MOTION
ELEMENTARY PARTICLES
REPRINT: SOLUTION OF A BETHE-SALPETER EQUATION.
AD-629 996 FLD. 20/8

STRUCTURAL SHELLS
TRANSLATION OF RUSSIAN RESEARCH: EQUATIONS FOR THEPERTURBED MOTION OF A RIGID BODY WITH A CYLINDRICALCAVITY PARTIALLY FILLED WITH LIQUID.
AD-629 917 FLD. 20/11

VIBRATION
TRANSLATION OF RUSSIAN RESEARCH: EQUATIONS OF TRANSVERSEVIBRATIONS OF FLUID-FILLED SHELLS.
AD-629 092 FLD. 20/11

•EQUATIONS OF STATE
SOLIDS
EQUATION OF STATE OF SOLIDS: ALUMINUM AND TEFLON.
AD-629 979 FLD. 20/13

•ETHANOLS
BLOOD CHEMISTRY
REPRINT: EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OFETHANOL FROM ARTERIAL BLOOD.
AD-629 921 FLD. 6/5

PHASE STUDIES
SEPARATION OF HYDRO-AZEOTROPES: TRANSLATION OF RUSSIANDOCUMENT.
AD-629 930 FLD. 7/4
TRANSLATIONS FROM THE RUSSIAN: LIQUID-VAPOR PHASEEQUILIBRIUM OF ALCOHOL - WATER MIXTURES IN THE PRESENCEOF CERTAIN SALTS, AT ATMOSPHERIC PRESSURE.
AD-629 931 FLD. 7/4

•ETHERS
CHROMATOGRAPHIC ANALYSIS
TRANSLATION OF RUSSIAN RESEARCH: GAS-LIQUIDCHROMATOGRAPHY OF METHYL ETHERS OF HIGHER FATTY ACIDSOF SENDAI VIRUS LIPID COMPONENT.
AD-629 626 FLD. 6/1

•EUROPIUM COMPOUNDS
OXIDES
REPRINT: THE EFFECT OF PRESSURE ON THE FERROMAGNETICPHASE TRANSITION OF EUO.
AD-629 109 FLD. 20/12

•EVAPORATION
HEAT TRANSFER
IMPROVED HEAT TRANSFER IN MULTISTAGE FLASH EVAPORATION.
AD-629 267 FLD. 20/13

•EVAPOTRANSPIRATION
COOLING
REPRINT: TRANSPIRATION COOLING WITH CHEMICAL REACTIONS.
AD-629 967 FLD. 20/13

•EXCHANGE REACTIONS
FLUORIDES
REPRINT: EXCHANGE REACTIONS IN THE SYSTEM BORON TRIFLUORIDEMETHANOL.
AD-629 969 FLD. 7/4

•EXCITATION
OXYGEN
REPRINT: EXCITED OXYGEN ATOMS IN THE PHOTOLYSIS OFN2O AND NO2.
AD-629 971 FLD. 8/1

PERTURBATION THEORY
PERTURBATION THEORY: LOWER BOUNDS TO ENERGY EIGENVALUES,GROUND STATE AND EXCITED STATES.
AD-629 369 FLD. 20/10

•EXHAUST GASES
OPTICAL PROPERTIES
EMPIRICAL INFRARED ABSORPTION COEFFICIENTS OF H2O FROM300K TO 3000K.
AD-629 582 FLD. 21/2

THERMOCHEMISTRY
ROCKET ENGINE EXHAUST PRODUCTS: THERMODYNAMICPROPERTIES.
AD-629 598 FLD. 21/9

•EXPERIMENTAL DATA
PSYCHOLOGY
REPRINT: THE PLACE OF SUBJECTIVE EXPERIENCE IN CONTEMPORARYPSYCHOLOGY.
AD-629 109 FLD. 5/10

•EXPERIMENTAL DESIGN
FACTOR ANALYSIS
MIXTURE DESIGNS FOR FOUR FACTORS.
AD-629 269 FLD. 12/1

•EXPLOSION EFFECTS
FIRES
SECONDARY FIRES IN NUCLEAR ATTACK.
AD-629 173 FLD. 13/12

•EXPLOSION GASES
CONCENTRATION(CHEMISTRY)
TRANSLATION OF RUSSIAN RESEARCH: CALCULATION OFCOMPOSITION OF EXPLOSIVES AND DETONATION PARAMETERSOF CONDENSED EXPLOSIVES.
AD-629 150 FLD. 19/1

•EXPLOSIVE MATERIALS
ABSTRACTS
THEORY OF DETONATION, THE COMBUSTION MECHANISM, AND THEPROPERTIES OF EXPLOSIVES: COMPILATION OF ABSTRACTS.
AD-629 326 FLD. 19/4

DETONATIONS
TRANSLATION OF RUSSIAN RESEARCH: CALCULATION OFCOMPOSITION OF EXPLOSIVES AND DETONATION PARAMETERSOF CONDENSED EXPLOSIVES.
AD-629 150 FLD. 19/1

FULMINATES
FULMINATES: A LITERATURE SURVEY.
AD-629 397 FLD. 7/3

REACTION KINETICS
TRANSLATION OF RUSSIAN RESEARCH: CONTRIBUTION TO THEPROBLEM OF ESTIMATING THE LENGTH OF THE CHEMICAL REACTIONZONE BEHIND THE FRONT OF A DETONATION WAVE.
AD-629 574 FLD. 19/4

•EXTRATERRESTRIAL RADIO WAVES
SCINTILLATION
EXPERIMENTAL INVESTIGATION OF THE COHERENCE DISTANCE OFTHE ATMOSPHERE FOR MICROWAVES.
AD-629 991 FLD. 20/14

•EYE
PATHOLOGY
REFRACTIVE CHARACTERISTICS AND INTRAOCULAR TENSIONS OFCOLONY CHIMPANZEES.
AD-629 333 FLD. 6/5

•FACTOR ANALYSIS
EXPERIMENTAL DESIGN
MIXTURE DESIGNS FOR FOUR FACTORS.
AD-629 269 FLD. 12/1

MATRIX ALGEBRA
FACTORING TO FIT OFF DIAGONALS.
AD-629 222 FLD. 5/9

•FAILURE(ELECTRONICS)
CHECKOUT PROCEDURES
ELECTRICAL ENGINEERING: INVESTIGATION OF FAULT DIAGNOSIS BYTRANSFER FUNCTION TECHNIQUES.
AD-629 587 FLD. 9/3

•FALLOUT SHELTERS
COOLING + VENTILATING EQUIPMENT
STUDY AND EVALUATION OF ABSORPTION-BASED COOLING SYSTEMSFOR USE IN CIVIL DEFENSE SHELTERS.
AD-629 436 FLD. 13/1

•FATTY ACIDS
ETHERS
TRANSLATION OF RUSSIAN RESEARCH:

GAS-LIQUIDCHROMATOGRAPHY OF METHYL ETHERS OF HIGHER FATTY ACIDSOF SENDAI VIRUS LIPID COMPONENT.
AD-629 626 FLD. 6/1

•FEEDBACK
CONTROL SYSTEMS
REPRINT: PERIODICALLY ADJUSTED FEEDBACK CONTROLSMULTIPLIER PHOTOTUBE.
AD-629 955 FLD. 9/5

•FERROELECTRIC CRYSTALS
FIELD THEORY
REPRINT: SWITCHING BEHAVIOR OF FERROELECTRIC BI4TI3012.
AD-629 013 FLD. 20/3

•FERROELECTRIC MATERIALS
RADIATION DAMAGE
FERROELECTRICS: THEIR ELECTRICAL BEHAVIOR DURING, ANDSUBSEQUENT TO, IONIZING RADIATIONS.
AD-629 091 FLD. 9/1

•FERROMAGNETIC MATERIALS
FILMS
TRANSLATION OF RUSSIAN RESEARCH: DEVICE FORSPRAYING FERROMAGNETIC FILMS ON A SUBSTRATE IN A VACUUM.
AD-629 285 FLD. 13/9

MICROWAVE EQUIPMENT
RESEARCH ON SELECTED MICROWAVE PROPERTIES OF FERRITES.
AD-629 315 FLD. 20/1

•FERROMAGNETISM
EUROPIUM COMPOUNDS
REPRINT: THE EFFECT OF PRESSURE ON THE FERROMAGNETICPHASE TRANSITION OF EUO.
AD-629 105 FLD. 20/12

•FIBERS
SEMICONDUCTORS
TRANSLATION OF RUSSIAN RESEARCH: SYNTHESIS OF SEMICONDUCTING COMPOSITES BY RADIATION GASEOUS-PHASEPOLYMERIZATION.
AD-629 912 FLD. 11/9

•FIELD THEORY
BOSONS
REPRINT: NOTE ON FIELD THEORIES WITHOUT MASSRENORMALIZATION.
AD-629 959 FLD. 20/8

ELEMENTARY PARTICLES
REPRINT: SELECTION RULES FOR PARAFIELDS AND THE ABSENCEOF PARA PARTICLES IN NATURE.
AD-629 972 FLD. 20/10

MESON SCATTERING
REPRINT: NUMERICAL SOLUTION OF FIXED-SOURCE FIELDTHEORIES.
AD-629 597 FLD. 20/10

OPERATORS(MATHEMATICS)
REPRINT: RELATIVISTIC SUPERMULTIPLET THEORIES.
AD-629 573 FLD. 20/8

QUANTUM MECHANICS
REPRINT: PROOF THAT SCATTERING IMPLIES PRODUCTION INQUANTUM FIELD THEORY.
AD-629 569 FLD. 20/8

S-MATRIX
REPRINT: PROBLEM OF CAUSALITY IN S-MATRIX THEORY.
AD-629 397 FLD. 20/10

•FILMS
TANTALUM
REPRINT: ANALYSIS OF THIN FILMS OF TANTALUM REACTIVELYSPUTTERED IN NITROGEN ATMOSPHERE.
AD-629 989 FLD. 7/2
IMPROVED THIN-FILM CAPACITOR CHARACTERISTICS BYREANODIZATION.
AD-629 531 FLD. 9/1

•FIRE SAFETY
STRUCTURES
BLAST AND IMPACT EXPOSURE OF EXISTING STRUCTURAL FIREPROTECTION SCHEMES.
AD-629 040 FLD. 13/12

•FIRES
NUCLEAR WARFARE
SECONDARY FIRES IN NUCLEAR ATTACK.
AD-629 173 FLD. 13/12

•FIRE-RESISTANT MATERIALS
HYDRAULIC FLUIDS
SYNTHESIS AND EVALUATION OF NEW FIRE RESISTANT HYDRAULICFLUIDS.
AD-629 209 FLD. 11/8

•FISHES
AUDITORY PERCEPTION
REPRINT: AUDITORY CAPACITIES IN FISHES: THRESHOLDVARIABILITY IN THE BLUE-STRIPED GRUNT, HAEMULONSCIURUS.
AD-629 299 FLD. 6/3

•FISSION PRODUCT POISONING
DIODES
EFFECT OF SIMULATED FISSION PRODUCTS IN THE INTER-ELECTRODESPACING OF A THERMIONIC DIODE.
AD-629 586 FLD. 18/10

•FITTINGS
PLASTICS
TRANSLATION OF RUSSIAN RESEARCH: PLASTIC MARINE FITTINGS.
AD-629 614 FLD. 13/10

•FLAME PROPAGATION
DIFFUSION
HETEROGENEOUS COMBUSTIONS AND FLAMES STRUCTURES.
AD-629 019 FLD. 21/2

•FLAMES
ELECTRONS
INVESTIGATION OF THE PROPERTIES OF HOT PLASMA GASES ANDMEASUREMENT OF GAS TEMPERATURES NEAR SOLID SURFACES.
AD-629 049 FLD. 20/9

•FLARES
CHEMICAL PROPERTIES
PRODUCTION OF VISIBLE LIGHT BY THE THORIA-CERIA MANTLE;PHYSICAL CHARACTERISTICS AND A PROPOSED THEORY OF THEOCCURRING MECHANISMS AND PROCESSES.
AD-629 008 FLD. 7/4

•FLASHBLINDNESS
WOUNDS + INJURIES
REPRINT: FLASH BLINDNESS.
AD-629 281 FLD. 6/5

•FLUID FLOW
CONTROL SYSTEMS
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-629 885 FLD. 13/7

CONVECTION(HEAT TRANSFER)
REPRINT: STABILITY OF A HOMOGENEOUS FLUID COOLED UNIFORMLYFROM ABOVE.
AD-629 984 FLD. 20/4

SOUND
FLUID MOTION AND SOUND; PROGRESS REPORTS.
AD-629 087 FLD. 20/4

•FLUID MECHANICS
OCEAN WAVES
INTERNAL OCEAN WAVES BIBLIOGRAPHY.
AD-629 237 FLD. 8/10

•FLUORESCENCE
RUBY
EFFECT OF GAMMA RADIATION ON FLUORESCENCE OF RUBY:TRANSLATION OF RUSSIAN ARTICLE.
AD-629 299 FLD. 20/2

SODIUM COMPOUNDS
ATOMIC FLUORESENCE OF SODIUM IODIDE.
AD-629 029 FLD. 7/4

•FLUORIDES
MOLECULAR STRUCTURE
DETERMINATION OF THE MOLECULAR STRUCTURE OF TRIOXYGENDIFLUORIDE.
AD-629 077 FLD. 7/2

•FLUORINE COMPOUNDS
ALKENES
SYNTHESIS OF UNSATURATED FLUOROCARBON COMPOUNDS FOR USEIN ELASTOMERS.
AD-629 867 FLD. 11/10

AROMATIC COMPOUNDS
INFRARED STUDY OF POLYFLUORINATED AROMATICS IN THE LOWFREQUENCY REGION.
AD-629 129 FLD. 7/3

AZINES
GENERATION OF THE FO RADICAL AND PRESSURE REACTIONS OFDIFLUORODIAZINE.
AD-629 928 FLD. 7/2

RELAXATION TIME
RELAXATION OF DILUTED NICKEL FLUOSILICATE AT LOW TEMPERATURESBY STEADY-STATE RESONANCE ABSORPTION TECHNIQUES.
AD-629 599 FLD. 20/12

SYNTHESIS(CHEMISTRY)
STUDIES OF LOW-TEMPERATURE OXIDATION REACTIONS.
AD-629 307 FLD. 7/2

•FLUTTER
PANELS(STRUCTURAL)
THEORETICAL CONSIDERATIONS OF PANEL FLUTTER AT HIGH SUPERSONIC MACH NUMBERS.
AD-629 995 FLD. 20/11

•FOAMS
ADSORPTION
PRIMARY ADSORPTION DURING SURFACTANT FOAM FORMATION.
AD-629 345 FLD. 11/11

STABILITY
TRANSFER OF AIR THROUGH ADSORBED SURFACE FILMS AS AFACTOR IN FOAM STABILITY.
AD-629 349 FLD. 11/11
SURFACE VISCOSITY OF DETERGENT SOLUTIONS AS A FACTOR INFOAM STABILITY.
AD-629 346 FLD. 11/11

•FORMATES
PHOTOCHEMISTRY
REPRINT: PHOTYLYSIS OF GASEOUS ALKYL AZIDOFORMATESWITH THE FORMATION OF CARBALKOXYNITRENES.
AD-629 537 FLD. 8/1

•FOUNDATIONS(STRUCTURES)
LOADING(MECHANICS)
REPRINT: CONSOLIDATION DUE TO TANGENTIAL LOADS.
AD-629 113 FLD. 13/13




799-657 O - 66 - 9

•FRACTURE(MECHANICS)
TITANIUM ALLOYS
STRESS CRACKING PROPERTIES OF TI-721 ALLOY TITANIUMLARGE SCALE BUTT WELDED AND BASE PLATE SPECIMENS INAIR AND SEA WATER.
AD-629 932 FLD. 11/6

•FREE RADICALS
ABSORPTION SPECTRUM
REPRINT: ABSORPTION SPECTRUM OF THE CCN RADICAL.
AD-629 968 FLD. 7/4

CHEMICAL REACTIONS
REPRINT: ION RADICALS. VII. THE REACTIONS OF THIANTHRENEOXIDE IN HYDROCHLORIC ACID.
AD-629 990 FLD. 7/3

POLYCYCLIC COMPOUNDS
REPRINT: SUBSTITUTED PERINAPHTHENYL ANION RADICALS.
AD-629 121 FLD. 7/3

SPECTROSCOPY
REPRINT: ION RADICALS. PHENOXATHIIN AND PHENOXATHIIN5-OXIDE IN SULFURIC ACID.
AD-629 992 FLD. 7/3
REPRINT: ION RADICALS. PHENOTHIAZINE, PHENOTHIAZINE5-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS.
AD-629 993 FLD. 7/3

•FREQUENCY
STANDARDS
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
AD-629 316 FLD. 14/2

•FREQUENCY CONVERTERS
CRYSTALS
TRANSLATION OF RUSSIAN RESEARCH: ON THE THEORY OF THECONVERSION OF THE FREQUENCY OF LIGHT WAVES BY A CRYSTAL.
AD-629 311 FLD. 20/6

•FRUITS
IRRADIATED FOODS
STUDY OF THE RADIATION-INDUCED SOFTENING OF PLANT TISSUES.
AD-629 983 FLD. 6/8

•FUEL ADDITIVES
BARIUM COMPOUNDS
TRANSLATION OF A RUSSIAN PATENT: BARIUM NAPHTHENATEADDITIVE TO SULFUROUS DIESEL-ENGINE FUELS.
AD-629 296 FLD. 21/4

PREPARATION
TRANSLATION OF A RUSSIAN PATENT: TRICRESYLPHOSPHATEBASED ADDITIVE TO SULFUROUS FUEL.
AD-629 298 FLD. 21/4

THIOLS
TRANSLATION OF A RUSSIAN PATENT: METHOD OFIMPROVING THE THERMO-OXIDATION STABILITY OF HYDROCARBONFUELS WITH MERCAPTAN ADDITIVES.
AD-629 297 FLD. 21/4

•FUEL CELLS
CATALYSTS
FUEL CELL CATALYSTS.
AD-629 127 FLD. 10/2

•FUEL CONSUMPTION
ROCKETS
MINIMUM FUEL TRAJECTORIES FOR THRUST LIMITED ROCKETS INAN ADVERSE SQUARE GRAVITY FIELD.
AD-629 399 FLD. 22/2

•FUEL CONTAMINATION
GAS TURBINES
TRANSLATION OF RUSSIAN RESEARCH: CHARACTERISTICS OFMICROCONTAMINATIONS IN AVERAGE DISTILLATE FUELS.
AD-629 199 FLD. 21/5

•FUEL OIL
FUEL ADDITIVES
TRANSLATION OF A RUSSIAN PATENT: BARIUM NAPHTHENATEADDITIVE TO SULFUROUS DIESEL-ENGINE FUELS.
AD-629 296 FLD. 21/4

•FUEL TANKS
HYPERSONIC PLANES
THERMAL PROTECTION FOR LIQUID-HYDROGEN FUEL TANKS INHIGH-SPEED, LONG-RANGE AIRCRAFT.
AD-629 907 FLD. 21/4

•FUELS
GAS ANALYSIS
TRANSLATION OF RUSSIAN PATENTS: METHOD OFDETERMINING THE FUEL COMPONENTS IN GASEOUS MIXTURES.
AD-629 189 FLD. 21/4

•FULMINATES
REVIEWS
FULMINATES: A LITERATURE SURVEY.
AD-629 397 FLD. 7/3

•FUNCTIONAL ANALYSIS
POLYNOMIALS
REPRINT: PIECEWISE POLYNOMIAL INTERPOLATION ANDAPPROXIMATION.
AD-629 863 FLD. 12/1

•FUNCTIONS
ELECTRICAL ENGINEERING
ELECTRICAL ENGINEERING: INVESTIGATION OF FAULT DIAGNOSIS BYTRANSFER FUNCTION TECHNIQUES.
AD-629 987 FLD. 9/3

•FUNGI
BIOCHEMISTRY
CYTOCHEMISTRY AND BIOCHEMISTRY OF THE FUNGUS PARACOCCIDOIDESBRASILIENSIS.
AD-629 973 FLD. 6/1

ORGANIC PIGMENTS
REPRINT: BIOSYNTHESIS OF PULCHERRIMINIC ACID.
AD-629 960 FLD. 6/1

•GALAXIES
SPECTROSCOPY
SPECTROSCOPIC AND RADIAL VELOCITY SURVEY OF BRIGHT GALAXIES.
AD-629 900 FLD. 3/2

•GALLIUM ALLOYS
SOLDERING ALLOYS
TRANSLATION OF RUSSIAN RESEARCH: SPECIFIC FEATURES INSOLDERING COPPER WITH GALLIUM-BASE SOLDERS.
AD-629 199 FLD. 13/8

•GAME THEORY
MATRIX ALGEBRA
REPRINT: LEHMAN'S SWITCHING GAME AND A THEOREM OFTUTTE AND NASH-WILLIAMS.
AD-629 906 FLD. 12/2

STATE-OF-THE-ART REVIEWS
MODERN UTILITY THEORY: 1940-1970.
AD-629 049 FLD. 12/2

•GAMMA EMISSION
FIELD THEORY
REPRINT: SPONTANEOUS SYMMETRY BREAKDOWN AND THE MU-EGAMMA INTERACTION.
AD-629 963 FLD. 20/8

•GAMMA-NEUTRON REACTIONS
NEUTRON SPECTRUM
NEUTRON SPECTRA FROM MONOENERGETIC PHOTONS OF BISMUTH.
AD-629 963 FLD. 20/8

•GARNET
MECHANICAL WAVES
REPRINT: AMPLIFICATION OF MAGNETOELASTIC WAVES INYTTRIUM IRON GARNET AT 300K.
AD-629 981 FLD. 20/12

•GAS ANALYSIS
TEST METHODS
TRANSLATION OF RUSSIAN PATENTS: METHOD OFDETERMINING THE FUEL COMPONENTS IN GASEOUS MIXTURES.
AD-629 189 FLD. 21/4

•GAS BEARINGS
MATERIALS
EVALUATION OF FRICTION AND WEAR CHARACTERISTICS OFMATERIALS FOR GAS-LUBRICATED BEARINGS UNDER CONDITIONSOF START-STOP, AND WHIRL INDUCED RUBBING.
AD-629 976 FLD. 13/9

STABILITY
EXPERIMENTS ON ULTRA-STABLE GAS JOURNAL BEARINGS.
AD-629 923 FLD. 13/9

•GAS DISCHARGES
NOISE GENERATORS
TRANSLATION OF CHINESE RESEARCH: MICROWAVE NOISESOURCE OF GAS DISCHARGE FOR CIRCULAR WAVEGUIDES.
AD-629 261 FLD. 9/5

•GAS FLOW
NUMERICAL ANALYSIS
TRANSLATION OF RUSSIAN RESEARCH: DIFFERENTIAL METHODFOR THE NUMERICAL SOLUTION OF TWO DIMENSIONAL NONSTATIONARY NAVIER-STOKES EQUATIONS FOR A COMPRESSIBLEGAS.
AD-629 098 FLD. 20/4

•GAS GENERATING SYSTEMS
UNDERWATER
HIGH-PRESSURE GAS FROM LITHIUM HYDRIDE AND SEA WATER FORUSE IN TORPEDO RECOVERY SYSTEMS.
AD-629 913 FLD. 19/8

•GAS IONIZATION
MAGNETOHYDRODYNAMICS
HYDROMAGNETIC IONIZING WAVES.
AD-629 171 FLD. 20/9

UPPER ATMOSPHERE
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERIC GASES.
AD-629 980 FLD. 4/1

•GAS TURBINE BLADES
HEAT-RESISTANT METALS + ALLOYS
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENT IN THE USEOF EI 893 ALLOY FOR GAS-TURBINE BLADES.
AD-629 290 FLD. 21/5

•GAS TURBINES
ENGINE STARTERS
TRANSLATION OF A RUSSIAN PATENT: REMOTE STARTING DEVICESFOR GAS TURBINES.
AD-629 199 FLD. 21/5

OPERATION
TRANSLATION OF RUSSIAN RESEARCH: DIMENSIONLESSCHARACTERISTICS OF GAS TURBINE UNITS WITH SLITTED SHAFTS.
AD-629 182 FLD. 21/5

OPTIMIZATION
TRANSLATION OF RUSSIAN RESEARCH: PROBLEM OF SELECTINGOPTIMUM PARAMETERS OF A DOUBLE CASCADE GAS

TURBINEENGINE.
AD-629 299 FLD. 21/5

THEORY
TRANSLATION OF RUSSIAN PATENT: CLOSED-CYCLE GAS-TURBINEINSTALLATION.
AD-629 001 FLD. 21/5

•GASES
CHEMICAL INDUSTRY
TRANSLATION OF RUSSIAN ARTICLE: GAS IN THE CHEMICAL INDUSTRY.
AD-629 612 FLD. 7/3

DIFFUSERS
REPRINT: CHAMBER FOR CONTINUOUS MIXING OF HIGH PRESSURECOMBUSTIBLE GASES.
AD-629 965 FLD. 14/2

PRODUCTION
COMPARISON OF TRANSIENT COMPRESSORS FOR THE PRODUCTION OFHIGH TEMPERATURE AND HIGH DENSITY GASES.
AD-629 970 FLD. 7/1

•GENETICS
HEMOPOIETIC SYSTEM
REPRINT: CELLULAR BASIS OF THE GENETICALLY DETERMINEDHEMOPOIETIC DEFECT IN ANEMIC MICE OF GENOTYPESL/SL(D).
AD-629 923 FLD. 6/16

•GEOCHEMISTRY
HALOGENS
GEOCHEMISTRY OF IODINE, BROMINE, AND CHLORIDE IN THEAIR-SEA-SEDIMENT SYSTEM.
AD-629 314 FLD. 8/5

LEAD
REPRINT: RADIOGENIC LEADS OF THE CANADIAN AND BALTICSHIELD REGIONS.
AD-629 998 FLD. 8/5

RARE EARTH ELEMENTS
RARE EARTH DISTRIBUTIONS IN THE MARINE ENVIRONMENT.
AD-629 347 FLD. 8/5

•GEOGRAPHY
TROPICAL REGIONS
INVENTORY OF GEOGRAPHIC RESEARCH OF THE HUMID TROPICENVIRONMENT. VOLUME I. KWIC INDEX. HUMID TROPICENVIRONMENTAL LITERATURE.
AD-629 926 FLD. 8/6

•GEOLOGY
MAPPING
RADAR AND GEOLOGY.
AD-629 887 FLD. 8/2

•GEOPHYSICS
MAGNETOHYDRODYNAMICS
STUDIES OF THE DYNAMO ACTION OF THE LIQUID CORE OF THE EARTH.
AD-629 457 FLD. 8/19

SYMPOSIA
IINTERNATIONAL YEARS OF THE QUIET SUN: SYMPOSIA HELD ATBUENOS AIRES, ARGENTINA.
AD-629 036 FLD. 4/1

•GERMANIUM
PHASE STUDIES
PHASE EQUILIBRIUM STUDIES OF GERMANIUM AND SILICONAT HIGH PRESSURES.
AD-629 928 FLD. 20/12

•GERMANIUM PHOTOELECTRIC CELLS(SEMICOND
STUDY OF GERMANIUM DEVICES FOR USE IN A THERMOPHOTOVOLTAIC CONVERTER.
AD-629 868 FLD. 9/1

•GLASS
SHIELDING
RADIATION ABSORBING GLASS.
AD-629 879 FLD. 11/2

•GLASS TEXTILES
AGING(MATERIALS)
INFLUENCE OF ENVIRONMENT ON ROVING AND LAMINATEPROPERTIES.
AD-629 030 FLD. 11/5

SEMICONDUCTORS
TRANSLATION OF RUSSIAN RESEARCH: SYNTHESIS OF SEMICONDUCTING COMPOSITES BY RADIATION GASEOUS-PHASEPOLYMERIZATION.
AD-629 912 FLD. 11/4

•GLOW DISCHARGES
ELECTROMAGNETIC WAVES
WAVE NATURE OF MOVING STRIATIONS.
AD-629 189 FLD. 20/9

•GLUTAMINE
METABOLISM
RESEARCH ON THE METABOLISM OF GLUTATHIONE, GLUTAMINE,AND RELATED COMPOUNDS.
AD-629 999 FLD. 6/16

•GLUTATHIONE
METABOLISM
RESEARCH ON THE METABOLISM OF GLUTATHIONE, GLUTAMINE,AND RELATED COMPOUNDS.
AD-629 999 FLD. 6/16

•GOLD
ANNEALING
REPRINT: NONEQUILIBRIUM SITUATIONS INVOLVING VACANCIESIN GOLD.
AD-629 877 FLD. 20/2

•GRAPHICS
MAN-MACHINE SYSTEMS
GRAPHICS: MAN-MACHINE COMMUNICATIONS.
AD-629 967 FLD. 9/8

OPTIMIZATION
REPRINT: MAXIMUM MATCHING AND A POLYHEDRON WITHO,1-VERTICES.
AD-629 907 FLD. 12/2

THEOREMS
REPRINT: SURFACE DUALITY OF LINEAR GRAPHS.
AD-629 904 FLD. 12/2

TOPOLOGY
REPRINT: PATHS, TREES, AND FLOWERS.
AD-629 903 FLD. 12/2

•GRAPHITE
ELECTRON SPIN RESONANCE
REPRINT: SPIN-ORBIT INTERACTION IN GRAPHITE.
AD-629 017 FLD. 20/12

•GRAVITY
CRATERING
INVESTIGATION OF THE EFFECTS OF GRAVITY ON CRATER FORMATIONIN A COHESIONLESS MEDIUM.
AD-629 391 FLD. 19/9

FIELD THEORY
REPRINT: PHOTONS AND GRAVITONS IN PERTURBATION THEORY:DERIVATION OF MAXWELL'S AND EINSTEIN'S EQUATIONS.
AD-629 962 FLD. 20/10

•GREASES
RHEOLOGY
RHEOLOGICAL PROPERTIES OF GREASES OVER WIDE TEMPERATURERANGES.
AD-629 136 FLD. 11/8

•GROUND STATE
PERTURBATION THEORY
PERTURBATION THEORY: LOWER BOUNDS TO ENERGY EIGENVALUES,GROUND STATE AND EXCITED STATES.
AD-629 969 FLD. 20/10

•GROUP DYNAMICS
BEHAVIOR
REPRINT: SOME PERSONAL AND SITUATIONAL FACTORSRELEVANT TO THE CONSISTENCY AND PREDICTION OF CONFORMINGBEHAVIOR.
AD-629 280 FLD. 5/10
EFFECT OF VARIATIONS IN INTERNAL POWER PATTERN ON COALITIONFORMATION IN TETRADS.
AD-629 992 FLD. 5/10

DECISION MAKING
REPRINT: INTERACTION PROCESS AND TASK OUTCOME INEXPERIMENTALLY-CREATED NEGOTIATION GROUPS.
AD-629 988 FLD. 5/10

PSYCHOMETRICS
CHANGES IN THE JUDGMENTS OF SENSITIZERS AND REPRESSERS INRESPONSE TO FAILURE AND SUCCESS EVALUATIONS OF GROUPPERFORMANCE.
AD-629 022 FLD. 5/10

•GUANIDINES
QUALITY CONTROL
ESTABLISHMENT OF QUALITY ASSURANCE REQUIREMENTS FORAMINOGUANIDINE BICARBONATE.
AD-629 929 FLD. 19/1

•GUIDANCE
INTERPLANETARY TRAJECTORIES
REPRINT: AN OPTIMAL DISCRETE CONTROL STRATEGY FOR INTERPLANETARY GUIDANCE.
AD-629 982 FLD. 22/3

ROCKETS
TRANSLATION OF RUSSIAN RESEARCH: ANALYTICAL CONSTRUCTIONOF THE GUIDANCE SYSTEM OF ROCKETS.
AD-629 093 FLD. 16/2

•GUIDED MISSILES
ADAPTIVE CONTROL SYSTEMS
TRANSLATION OF RUSSIAN RESEARCH: ANALYTICAL CONSTRUCTIONOF THE GUIDANCE SYSTEM OF ROCKETS.
AD-629 093 FLD. 16/2

CHECKOUT EQUIPMENT
SOME ASPECTS OF AUTOMATIC TEST AND CHECKOUT IN MISSILEAND SPACE SYSTEMS.
AD-629 392 FLD. 16/1

•GUIDED MISSILES(UNDERWATER-TOSURFACE)
DOCUMENTATION
CENTER FOR ANALYSIS OF INFORMATION ON THE SUBMARINELAUNCHED MISSILE: DEFINITION OF REQUIREMENTS.
AD-629 193 FLD. 5/2

•GYPSUM
FRACTURE(MECHANICS)
FRACTURE OF GYPSUM PLASTERS AND CEMENT MORTARS BYDYNAMIC LOADING.
AD-629 458 FLD. 11/2

•HALIDES
SPECTRA(INFRARED)
INFRARED SPECTRA OF POLYATOMIC HIGH-TEMPERATUREMOLECULES: LITHIUM FLUORIDE AND LITHIUM CHLORIDE VAPORIZATION SPECIES.
AD-629 049 FLD. 7/2

•HALOCARBON PLASTICS
ADDITIVES

TRANSLATION OF RUSSIAN RESEARCH: FILLED FLUOROCARBONPLASTICS AS ANTIFRICTION AND CHEMICALLY STABLE MATERIALSFOR CHEMICAL MACHINE BUILDING.
AD-629 092 FLD. 11/9

EQUATIONS OF STATE
EQUATION OF STATE OF SOLIDS: ALUMINUM AND TEFLON.
AD-629 979 FLD. 20/13

PREPARATION
SYNTHESIS OF UNSATURATED FLUOROCARBON COMPOUNDS FOR USEIN ELASTOMERS.
AD-629 867 FLD. 11/10

•HALOGENATED HYDROCARBONS
COMPLEX COMPOUNDS
TRANSITION-METAL CARBON CHEMISTRY: USE OF HEXAFLUOROBUT2-YNE FOR THE PREPARATION OF INORGANIC COMPLEX COMPOUNDS.
AD-629 988 FLD. 7/2

HYDRAULIC FLUIDS
SYNTHESIS AND EVALUATION OF NEW FIRE RESISTANT HYDRAULICFLUIDS.
AD-629 209 FLD. 11/8

MICROWAVE SPECTROSCOPY
MICROWAVE SPECTROSCOPIC STUDIES OF MOLECULES.
AD-629 497 FLD. 7/4

SPECTRA(INFRARED)
INFRARED STUDY OF POLYFLUORINATED AROMATICS IN THE LOWFREQUENCY REGION.
AD-629 128 FLD. 7/3

SYNTHESIS(CHEMISTRY)
SYNTHESIS OF UNSATURATED FLUOROCARBON COMPOUNDS FOR USEIN ELASTOMERS.
AD-629 867 FLD. 11/10

•HALOGENS
GEOCHEMISTRY
GEOCHEMISTRY OF IODINE, BROMINE, AND CHLORIDE IN THEAIR-SEA-SEDIMENT SYSTEM.
AD-629 319 FLD. 8/5

•HAMILTONIAN
INVARIANCE
LORENTZ INVARIANCE, MOMENTUM-ENERGY TENSORS, AND THEM H D PROBLEM.
AD-629 268 FLD. 20/9

•HARMONIC ANALYZERS
SOUND SIGNALS
TRANSLATION OF RUSSIAN PATENT: DEVICE FOR THE ANALYSIS OFTHE INSTANTANEOUS SPECTRUM OF A VOICE SIGNAL IN HARMONICDECODERS.
AD-629 197 FLD. 20/1

•HEAD
WOUNDS + INJURIES
RELATION BETWEEN CRANIOCEREBRAL TRAUMA AND ITS SEQUELAE.
AD-629 031 FLD. 6/5

•HEARING
RECALL
REPRINT: MANIPULATION OF STRATEGIES OF REPORT IN DICHOTICLISTENING.
AD-629 106 FLD. 5/10

•HEART
ACCELERATION TOLERANCE
CINERADIOGRAPHIC OBSERVATIONS OF HUMAN SUBJECTS DURINGTRANSVERSE ACCELERATIONS OF 5GX AND 10GX.
AD-629 254 FLD. 6/19

SHOCK(PATHOLOGY)
REPRINT: MYOCARDIAL CATECHOLAMINES AND STIMULATIONOF THE STELLATE GANGLION IN HEMORRHAGIC SHOCK.
AD-629 279 FLD. 6/5

•HEAT TRANSFER
AERODYNAMIC HEATING
MEASUREMENT OF THE HEAT TRANSFER TO A TWO-DIMENSIONALHYPERSONIC INLET WITH VARIABLE GEOMETRY.
AD-629 095 FLD. 20/13

ATMOSPHERIC MOTION
TRANSLATION OF RUSSIAN RESEARCH: HEAT MASS TRANSFER.
AD-629 066 FLD. 4/1

EVAPORATION
IMPROVED HEAT TRANSFER IN MULTISTAGE FLASH EVAPORATION.
AD-629 267 FLD. 20/13

FLUIDS
REPRINT: METHOD OF WEIGHTED RESIDUALS AND ITS RELATIONTO CERTAIN VARIATIONAL PRINCIPLES FOR THE ANALYSIS OFTRANSPORT PROCESSES.
AD-629 951 FLD. 4/1

THERMAL RADIATION
RADIATIVE HEAT TRANSFER BETWEEN PARALLEL PLATES SEPARATEDBY A NON-ISOTHERMAL MEDIUM ANISOTROPIC SCATTERING.
AD-629 203 FLD. 20/13

•HEATS OF FORMATION
BORIDES
HEATS OF FORMATION OF METALLIC BORIDES BY FLUORINE BOMBCALORIMETRY.
AD-629 336 FLD. 7/4

•HEAT-RESISTANT MATERIALS
ELASTOMERS
SYNTHESIS OF AMINOQUINONE POLYMERS FOR USE AS HEATRESISTANT ELASTOMERS.
AD-629 891 FLD. 11/10

•HEAT-RESISTANT METALS + ALLOYS
GAS TURBINE BLADES
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENT IN THE USEOF EI 893 ALLOY FOR GAS-TURBINE BLADES.
AD-629 290 FLD. 21/5

STRESS CORROSION
TRANSLATION OF RUSSIAN RESEARCH: PROBLEM OF THE BEHAVIOROF HEAT RESISTANT ALLOYS IN CONTACT WITH SODIUM IN STRESSEDSTATE.
AD-629 198 FLD. 11/6

•HELICAL ANTENNAS
EFFECTIVENESS
REPRINT: OPTIMIZING EFFICIENCY AND BANDWIDTH OF INDUCTIVELYLOADED ANTENNAS.
AD-629 951 FLD. 9/5

•HELIUM
ELASTIC SCATTERING
ELASTIC SCATTERING OF LOW ENERGY ELECTRONS FROM ATOMICHELIUM.
AD-629 919 FLD. 20/8

•HEMOGLOBIN
BLOOD DISEASES
REPRINT: HAEMOGLOBIN E IN VIETNAMESE.
AD-629 111 FLD. 6/5
REPRINT: HAEMOGLOBIN J AND E IN A THAI KINDRED.
AD-629 959 FLD. 6/5

•HEMOPOIETIC SYSTEM
GENETICS
REPRINT: CELLULAR BASIS OF THE GENETICALLY DETERMINEDHEMOPOIETIC DEFECT IN ANEMIC MICE OF GENOTYPESL/SL(D).
AD-629 923 FLD. 6/16

•HETEROCYCLIC COMPOUNDS
SYNTHESIS(CHEMISTRY)
REPRINT: 2,3-NAPHTHOQUINONOID HETEROCYCLES. II. A HIGHLYSTABILIZED THIADIAZOLE ANALOG OF ANTHRACENE.
AD-629 636 FLD. 7/3

•HIGH FREQUENCY
RADIO TRANSMISSION
A STUDY OF HIGH-FREQUENCY DIRECTIONAL PROPAGATION OVER A4500 KILOMETER EAST-TO-WEST PATH. PART I. DESCRIPTION OFTHE DIRECTIONAL PROPAGATION EXPERIMENT (THE COLUMBUSEXPERIMENT). PART II. AN ATLAS OF REDUCED DATA.
AD-629 913 FLD. 17/3

•HIGH VACUUM VALVES
OPERATION
PRESSURE BURSTS IN BAKEABLE ULTRA-HIGH VACUUM VALVESDURING OPENING AND CLOSING.
AD-629 120 FLD. 13/11

•HILSCH TUBES
PERFORMANCE(ENGINEERING)
AERODYNAMIC PERFORMANCE OF REVERSED FLOW VORTEXCHAMBERS.
AD-629 909 FLD. 14/2

•HOSPITALS
ENTEROBACTERIACEAE
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF THE ABILITYOF ENTERIC BACTERIA TO INFECT THE AIR OF HOSPITAL WARDS.
AD-629 628 FLD. 6/19

•HOT WORKING
LUBRICANTS
TRANSLATION OF A RUSSIAN PATENT: METHOD OF OBTAININGLUBRICANT FOR HOT WORKING OF METALS.
AD-629 000 FLD. 11/8

•HUMAN ENGINEERING
TARGET RECOGNITION
TARGET DETECTION USING BLACK-AND-WHITE TELEVISION.DEGRADED RESOLUTION AND TARGET-DETECTION PROBABILITY.
AD-629 230 FLD. 17/8
TARGET DETECTION USING BLACK-AND-WHITE TELEVISION. THEEFFECTS OF RESOLUTION DEGRADATION ON TARGET DETECTION.
AD-629 231 FLD. 17/8

•HUMIDITY
TROPICAL REGIONS
INVENTORY OF GEOGRAPHIC RESEARCH OF THE HUMID TROPICENVIRONMENT. VOLUME I. KWIC INDEX. HUMID TROPICENVIRONMENTAL LITERATURE.
AD-629 926 FLD. 8/6
HUMID TROPICS RESEARCH: DIRECTORY OF INSTITUTIONS FORTHE INTERNATIONAL GEOGRAPHICAL UNION.
AD-629 927 FLD. 8/6

•HURRICANE TRACKING
ATMOSPHERIC SOUNDING
REPRINT: OZONE AND TEMPERATURE STRUCTURE IN A HURRICANE.
AD-629 123 FLD. 4/2

•HYDRAULIC FLUIDS
SYNTHESIS(CHEMISTRY)
SYNTHESIS AND EVALUATION OF NEW FIRE RESISTANT HYDRAULICFLUIDS.
AD-629 209 FLD. 11/8

•HYDRAZINE
DECOMPOSITION
REPRINT: DETERMINATION OF THE

DECOMPOSITION KINETICS OFHYDRAZINE USING A SINGLE-PULSE SHOCK TUBE.
AD-629 179 FLD. 7/4

•HYDROCARBONS
OXIDATION
REPRINT: ABSOLUTE RATE CONSTANTS FOR HYDROCARBONAUTOXIDATION. DEUTERO STYRENES AND RING-SUBSTITUTEDSTYRENES.
AD-629 969 FLD. 7/4

STABILIZATION
TRANSLATION OF A RUSSIAN PATENT: METHOD OFIMPROVING THE THERMO-OXIDATION STABILITY OF HYDROCARBONFUELS WITH MERCAPTAN ADDITIVES.
AD-629 297 FLD. 21/4

•HYDROGEN
ATOMIC PROPERTIES
INTERACTION OF THREE HYDROGEN ATOMS.
AD-629 900 FLD. 20/8

MOLECULAR ORBITALS
INTERACTION POTENTIAL SURFACE FOR TRIATOMIC HYDROGEN.
AD-629 219 FLD. 7/4

SYNTHESIS(CHEMISTRY)
HIGH-PRESSURE GAS FROM LITHIUM HYDRIDE AND SEA WATER FORUSE IN TORPEDO RECOVERY SYSTEMS.
AD-629 913 FLD. 19/8

•HYPERBOLIC NAVIGATION
NAVIGATION CHARTS
OMEGA NAVIGATIONAL SYSTEM CONDUCTIVITY MAP.
AD-629 990 FLD. 17/7

•HYPERONS
DECAY SCHEMES
FORTRAN PROGRAMME FOR THE ANALYSISOF HYPERFRAGMENTSAND FOR OTHER EMULSION STUDIES.
AD-629 019 FLD. 18/8

•HYPERSONIC CHARACTERISTICS
DELTA WINGS
CALCULATION OF THE FORCE COEFFICIENT FOR DELTA WINGS INHYPERSONIC FLOW.
AD-629 909 FLD. 20/4

•HYPERSONIC FLOW
CYLINDRICAL BODIES
EXPERIMENTAL INVESTIGATIONS OF HYPERSONIC FLOW AROUNDTWO-DIMENSIONAL CIRCULAR CYLINDERS.
AD-629 384 FLD. 20/4

REVIEWS
EXPERIMENTAL AND ANALYTICAL STUDIES IN CONTINUUMHYPERSONIC FLOW.
AD-629 209 FLD. 20/4

•HYPERSONIC WIND TUNNELS
CONDENSATION
OBSERVED SUPERSATURATION IN THE ARL 20-INCH HYPERSONICWIND TUNNEL.
AD-629 293 FLD. 14/2

•HYPOGLYCEMIA
HYPOTHERMIA
REPRINT: THE EFFECT OF TOLBUTAMIDE (RASTINON) ON THELEVELS OF GLUCOSE AND INORGANIC PHOSPHORUS OF BLOOD INNORMOTHERMIC AND HYPOTHERMIC RATS.
AD-629 908 FLD. 6/15

•HYPOTHERMIA
BLOOD CHEMISTRY
REPRINT: THE EFFECT OF TOLBUTAMIDE (RASTINON) ON THELEVELS OF GLUCOSE AND INORGANIC PHOSPHORUS OF BLOOD INNORMOTHERMIC AND HYPOTHERMIC RATS.
AD-629 908 FLD. 6/15

ETHANOLS
REPRINT: EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OFETHANOL FROM ARTERIAL BLOOD.
AD-629 921 FLD. 6/5

•ICE
PHASE STUDIES
REPRINT: ENTROPY CHANGES AT THE PHASE TRANSITIONS IN ICE.
AD-629 974 FLD. 7/4

•IMMUNITY
SALMONELLA
TRANSLATION OF RUSSIAN RESEARCH: IMMUNOLOGICAL ACTIVITYOF LYMPHOID ORGANS DURING AEROSOL AND SUBCUTANIOUSTYPHOID IMMUNIZATION.
AD-629 691 FLD. 6/13

•IMMUNOLOGY
COMPLEMENT
REPRINT: ANTIBODY-COMPLEMENT COMPLEXES.
AD-629 879 FLD. 6/13

•INDIAN OCEAN
OCEANOLOGY
CRUISE PLANS FOR R/V CHAIN CRUISE NO. 43, INDIAN OCEANEXPEDITION.
AD-629 999 FLD. 8/10

•INDUSTRIAL EQUIPMENT
MATERIALS
TRANSLATION OF RUSSIAN RESEARCH: FILLED FLUOROCARBONPLASTICS AS ANTIFRICTION AND CHEMICALLY STABLE MATERIALSFOR CHEMICAL MACHINE BUILDING.
AD-629 092 FLD. 11/9

VAPOR PLATING
TRANSLATION OF RUSSIAN RESEARCH: DEVICE FORSPRAYING FERROMAGNETIC FILMS ON A SUBSTRATE IN A VACUUM.
AD-629 289 FLD. 13/9

•INDUSTRIAL PRODUCTION
CHINA
RATE AND PATTERN OF INDUSTRIAL GROWTH IN COMMUNIST CHINA.
AD-629 902 FLD. 5/3

•INERTIAL GUIDANCE
INSTRUMENTATION
INERTIAL GUIDANCE INSTRUMENT DESIGN VERIFICATION TESTS FORHIGH-G APPLICATIONS.
AD-629 092 FLD. 17/7

•INFORMATION RETRIEVAL
DATA PROCESSING SYSTEMS
RELATIONAL DATA FILE: A TOOL FOR MECHANIZED INFERENCEEXECUTION AND DATA RETRIEVAL.
AD-629 909 FLD. 9/2

LANGUAGE
REPRINT: USE OF META-LANGUAGE IN INFORMATION RETRIEVALSYSTEMS.
AD-629 977 FLD. 9/2

PHOTOGRAPHY
PHOTOGRAPHY IN INFORMATION STORAGE AND RETRIEVAL:1969 SYMPOSIUM.
AD-629 029 FLD. 9/2

TRANSFORMATIONAL GRAMMARS
TRANSFORMATION OF SENTENCES FOR INFORMATION RETRIEVAL.
AD-629 890 FLD. 9/2

•INFORMATION THEORY
MATHEMATICAL LOGIC
SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.
AD-629 988 FLD. 12/1

SCIENTIFIC RESEARCH
CONSOLIDATED SEMIANNUAL PROGRESS REPORT NO. 2, 1 APRIL1969 THROUGH 30 SEPTEMBER 1969, BY ELECTRONICS SCIENCESLABORATORY, UNIVERSITY OF SOUTHERN CALIFORNIA.
AD-629 971 FLD. 20/12

STOCHASTIC PROCESSES
REPRINT: STOCHASTIC SIGNAL PARAMETER ESTIMATION.
AD-629 866 FLD. 9/9

•INFRARED EQUIPMENT
RADIOMETERS
REPRINT: APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY.
AD-629 998 FLD. 4/2
DUAL-CHANNEL SATELLITE RADIOMETER TO MAKE INFRAREDMEASUREMENTS.
AD-629 380 FLD. 17/5

•INFRARED RADIATION
ABSORPTION
EMPIRICAL INFRARED ABSORPTION COEFFICIENTS OF H2O FROM300K TO 3000K.
AD-629 582 FLD. 21/2

•INFRARED SPECTROSCOPY
HALOGENATED HYDROCARBONS
INFRARED STUDY OF POLYFLUORINATED AROMATICS IN THE LOWFREQUENCY REGION.
AD-629 129 FLD. 7/3

POLYATOMIC MOLECULES
INFRARED SPECTRA OF POLYATOMIC HIGH-TEMPERATUREMOLECULES: LITHIUM FLUORIDE AND LITHIUM CHLORIDE VAPORIZATION SPECIES.
AD-629 049 FLD. 7/2

SOLID STATE PHYSICS
REPRINT: CHARACTERISTIC FREQUENCIES FROM INFRARED ANDELASTIC DATA.
AD-629 166 FLD. 20/12

•INFRARED SPECTRUM
ATMOSPHERE
BALLOON BORNE INFRARED STUDIES.
AD-629 349 FLD. 4/1

•INLAND WATERWAYS
SOIL MECHANICS
LABORATORY STUDIES ON THE EFFECTS OF LABORATORY SIMULATEDEARTHQUAKE LOADINGS ON COHESIVE SOIL STRENGTH, SAN LUIS DAMAND CANAL--SAN LUIS UNIT CENTRAL VALLEY PROJECT, CALIFORNIA.
AD-629 443 FLD. 8/13

•INORGANIC POLYMERS
PHASE STUDIES
GLASS TRANSITION IN IONIC PHOSPHATE POLYMERS.
AD-629 330 FLD. 11/9

VISCOELASTICITY
VISCOELASTIC RELAXATION MECHANISM OF INORGANIC POLYMERS:SIMULTANEOUS MULTIPLE MECHANISM IN LANTHANUM-DOPEDSODIUM POLYPHOSPHATE AND IN ARSENIC-DOPED SULFUR POLYMER.
AD-629 329 FLD. 11/9
VISCOELASTIC RELAXATION MECHANISMS OF INORGANICPOLYMERS: COUNTERION EFFECTS IN BULK PHOSPHATEPOLYELECTROLYTES.
AD-629 331 FLD. 11/9

•INPUT-OUTPUT DEVICES
ALGEBRAS
THE ALGEBRA OF BLOCK DIAGRAMS.

AD-629 081 FLD. 12/1

PNEUMATIC DEVICES
TRANSLATION OF A RUSSIAN PATENT: PNEUMATIC CONVERTER.
AD-629 906 FLD. 13/7

SENSITIVITY
COMPUTATIONAL PROCEDURES FOR SENSITIVITY COEFFICIENTS INTIME-INVARIANT MULTIVARIABLE SYSTEMS.
AD-629 010 FLD. 12/1

•INSECTS
DISEASE VECTORS
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN,CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE,VOLUME 4, NO. 12.
AD-629 274 FLD. 6/3

SENSORY PERCEPTION
ACTIVITY OF INSECT NERVES AND SENSE ORGANS: SUMMARYREPORT.
AD-629 034 FLD. 6/3

•INSTERSTELLAR MATTER
TURBULENCE
TRANSLATION OF RUSSIAN RESEARCH: STRUCTURAL, CORRELATION,AND SPECTRAL FUNCTIONS OF INTERSTELLAR GAS TURBULENCE.
AD-629 919 FLD. 3/2

•INSTRUMENTATION
DIODES(SEMICONDUCTOR)
REPRINT: APPARATUS FOR APPLYING UNIAXIAL PRESSURE AT VERYLOW TEMPERATURES.
AD-629 020 FLD. 14/2

STANDARDS
INSTRUMENT STANDARDS.
AD-629 923 FLD. 14/2

TESTS
INERTIAL GUIDANCE INSTRUMENT DESIGN VERIFICATION TESTS FORHIGH-G APPLICATIONS.
AD-629 042 FLD. 17/7

•INTEGRAL EQUATIONS
WAVE FUNCTIONS
METHOD OF SOLVING THE INTEGRAL EQUATIONS FOR THE VERTICALPROPAGATION OF TIME-HARMONIC ELECTROMAGNETIC PLANEWAVES IN ANISOTROPIC VERTICALLY-HOMOGENEOUS MEDIA.
AD-629 609 FLD. 20/14

•INTEGRAL TRANSFORMS
NUMBER THEORY
REPRINT: THEOREM ON THE ZEROS OF CAUSAL TRANSFORMS.
AD-629 557 FLD. 12/1

SYNTHESIS
REPRINT: SYNTHESIS METHOD FOR LINEAR TIME-VARYING SYSTEMS.
AD-629 983 FLD. 9/3

•INTEGRATED CIRCUITS
MATHEMATICAL ANALYSIS
STEADY-STATE AND TRANSIENT RESPONSE OF ARBITRARY TAPEREDDISTRIBUTED RC NETWORKS WITH LUMPED LOAD TERMINATIONS.
AD-628 392 FLD. 9/5

•INTERMETALLIC COMPOUNDS
PRINTED CIRCUITS
MICROELECTRONIC SOLID-STATE DISPLAY ASSEMBLY.
AD-629 370 FLD. 9/5

•INTERNAL COMBUSTION ENGINES
OPERATION
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF OIL OXIDATIONON THE PROCESS OF RUNNING-IN A RING-SOCKET PAIR IN ANINTERNAL COMBUSTION ENGINE.
AD-629 910 FLD. 21/7

•INTERPLANETARY TRAJECTORIES
GUIDANCE
REPRINT: AN OPTIMAL DISCRETE CONTROL STRATEGY FOR INTERPLANETARY GUIDANCE.
AD-629 982 FLD. 22/3

N-BODY PROBLEM
INVESTIGATION OF THE EFFECT OF LAUNCH SITE LOCATION ANDVARIATION OF LAUNCH PARAMETERS ON LUNAR-EARTH TRAJECTORIES.
AD-629 399 FLD. 22/3

•IODIDES
RESISTANCE(ELECTRICAL)
ELECTRICAL EFFECTS OF SHOCK WAVES: CONDUCTIVITY IN CSI, KI,AND NACL.
AD-629 568 FLD. 20/11

•IONIZATION
PROBABILITY
CESIUM IONIZATION CROSS SECTION FROM THRESHOLD TO 90 EV.
AD-629 491 FLD. 7/4

•IONIZATION POTENTIALS
MEASUREMENT
PHOTOIONIZATION IN GASES.
AD-629 312 FLD. 20/3

•IONOSPHERIC PROPAGATION
RADIO WAVES
A STUDY OF HIGH-FREQUENCY DIRECTIONAL PROPAGATION OVER A950 KILOMETER EAST-TO-WEST PATH. PART I. DESCRIPTION OFTHE DIRECTIONAL PROPAGATION EXPERIMENT (THE COLUMBUSEXPERIMENT). PART II. AN ATLAS OF REDUCED DATA.
AD-629 913 FLD. 17/3

SCIENTIFIC RESEARCH
ABSTRACTS OF RESEARCH PAPERS CONCERNED WITH IONOSPHERICPROPAGATION, PLASMA PHYSICS, CYCLOTRON RESONANCE, ANDWHISTLERS.
AD-629 903 FLD. 4/1

•IONS
DISTRIBUTION
REPRINT: IONIC DISTRIBUTION IN LIQUID SILICATES.
AD-629 962 FLD. 7/4

•IRON
NEUTRON CROSS SECTIONS
REPRINT: FE54(N,P), (N,ALPHA), AND (N,2N) CROSS SECTIONS.
AD-629 980 FLD. 20/8

PARAMAGNETIC RESONANCE
REPRINT: PARAMAGNETIC RESONANCE OF TRIVALENT FE57 INDOUBLE NITRATE CRYSTALS.
AD-629 872 FLD. 7/4

TERRESTRIAL MAGNETISM
TRANSLATION OF RUSSIAN RESEARCH: AURORAS AND IRONDEPOSITS.
AD-629 290 FLD. 4/1

•IRON ALLOYS
CASTINGS
INVESTIGATION OF SOLIDIFICATION OF HIGH-STRENGTH STEELCASTINGS.
AD-629 987 FLD. 11/6

•IRRADIATED FOODS
ACCEPTABILITY
STUDIES OF BEEF IRRADIATION FLAVOR USING A CONCURRENTRADIATION-DISTILLATION TECHNIQUE.
AD-629 994 FLD. 6/8

HEAT
DETERMINATION OF EQUIVALENCE BETWEEN RADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CUREDMEATS.
AD-629 292 FLD. 6/8

•JET ENGINE FUELS
CONTAMINATION
TRANSLATION OF RUSSIAN RESEARCH: CHARACTERISTICS OFMICROCONTAMINATIONS IN AVERAGE DISTILLATE FUELS.
AD-629 149 FLD. 21/8

CRYOGENICS
THERMAL PROTECTION FOR LIQUID-HYDROGEN FUEL TANKS INHIGH-SPEED, LONG-RANGE AIRCRAFT.
AD-629 907 FLD. 21/4

FUEL ADDITIVES
TRANSLATION OF A RUSSIAN PATENT: METHOD OFIMPROVING THE THERMO-OXIDATION STABILITY OF HYDROCARBONFUELS WITH MERCAPTAN ADDITIVES.
AD-629 247 FLD. 21/4

IMPURITIES
TRANSLATION OF RUSSIAN RESEARCH: INSOLUBLE RESIDUES,FORMING DURING THE HEATING OF JET FUELS.
AD-629 143 FLD. 21/4

•JETS
FLUID DYNAMIC PROPERTIES
HYDRAULIC ANALOG STUDY OF THE HARTMANN OSCILLATORPHENOMENON.
AD-629 085 FLD. 20/4

NOISE
ASPECTS OF JET FLOWS AND EDGETONES.
AD-629 086 FLD. 20/4

•JOURNAL BEARINGS
STABILITY
EXPERIMENTS ON ULTRA-STABLE GAS JOURNAL BEARINGS.
AD-629 923 FLD. 13/9

•JUPITER(PLANET)
OPTICAL PHENOMENA
REPRINT: ON JOVIAN H-ALPHA AURORAL ACTIVITY.
AD-629 883 FLD. 3/2
SEARCH FOR PLANETARY OPTICAL EMISSION, AND STUDY OF FLAREACTIVITY OF NEARBY STARS.
AD-629 895 FLD. 3/2

•KETONES
CONDENSATION REACTIONS
REPRINT: TETRASODIO BIS-BETA-DIKETONES. DICONDENSATIONSWITH ELECTROPHILIC COMPOUNDS.
AD-629 639 FLD. 7/3

PHOTOLYSIS
REPRINT: THE PHOTOLYTIC DECOMPOSITION OF SOME SULFONES BYAN INTERNALLY SENSITIZED PATH.
AD-629 638 FLD. 7/3

•KINETIC THEORY
MEASUREMENT
REPRINT: STUDY OF THERMAL TRANSPIRATION USING ULTRA-HIGHVACUUM TECHNIQUES.
AD-629 959 FLD. 20/13

•LABORATORY ANIMALS
DISEASES
TRANSLATION OF RUSSIAN RESEARCH: ZOONOSES OF LABORATORYANIMALS AND THEIR DANGER TO MAN.
AD-629 610 FLD. 6/3

INFECTIONS
RECOVERY OF SPECIFIC

MICROORGANISMS FROM URINE ANDFECES OF INFECTED ANIMALS.
AD-629 256 FLD. 6/13

•LABORATORY EQUIPMENT
SPACE ENVIRONMENTAL CONDITIONS
REPRINT: AN ATTEMPT TO REDUCE THE GAS LOAD IN AN ULTRAHIGHVACUUM CHAMBER.
AD-629 132 FLD. 14/2

•LANGMUIR PROBES
ERRORS
REPRINT: DEVICE FOR TAKING THE SECOND DERIVATIVE OF THECURRENT-VOLTAGE CHARACTERISTIC OF A LANGMUIR PROBE:THEORETICAL ERROR.
AD-629 012 FLD. 14/2

•LANGUAGE
ANALYSIS
NATURAL-LANGUAGE PROCESSING BY COMPUTERS: STATE OF THEART BY 1966.
AD-629 005 FLD. 9/7

•LASERS
DIODES(SEMICONDUCTOR)
REPRINT: APPARATUS FOR APPLYING UNIAXIAL PRESSURE AT VERYLOW TEMPERATURES.
AD-629 020 FLD. 14/2

ORGANIC MATERIALS
LASER-PUMPED LASER.
AD-629 338 FLD. 20/5

SCIENTIFIC RESEARCH
TRANSLATION OF CHINESE RESEARCH BULLETIN: HIGH POWERRUBY LASER AND SIGNAL-TO-NOISE RATIO IN THE DATASAMPLING PROCESS.
AD-629 090 FLD. 14/2

SEMICONDUCTORS
GAAS INJECTION LASER INVESTIGATION.
AD-629 939 FLD. 20/5

•LAUNCHING
LUNAR BASES
INVESTIGATION OF THE EFFECT OF LAUNCH SITE LOCATION ANDVARIATION OF LAUNCH PARAMETERS ON LUNAR-EARTH TRAJECTORIES.
AD-629 394 FLD. 22/3

•LEAD
AIR POLLUTION
REPRINT: CONCENTRATIONS OF COMMON LEAD IN GREENLANDSNOWS.
AD-629 997 FLD. 8/8

GEOCHEMISTRY
REPRINT: RADIOGENIC LEADS OF THE CANADIAN AND BALTICSHIELD REGIONS.
AD-629 998 FLD. 8/8

•LEARNING
ELECTROPHYSIOLOGY
BIOPOTENTIAL SIGNALS AS A FUNCTION OF LEARNING TASKDIFFICULTY.
AD-629 130 FLD. 5/10

PROBABILITY
REPRINT: PROBABILITY LEARNING IN STEP-INPUT TRACKING.
AD-629 103 FLD. 5/10

WORD ASSOCIATION
REPRINT: UNLEARNING UNDER CONDITIONS OF SUCCESSIVEINTERPOLATION.
AD-629 283 FLD. 5/10

•LEARNING MACHINES
MICROMINIATURIZATION(ELECTRONICS)
APPLICATION OF MICROELECTRONICS TO SYNTHETIC NERVENETWORKS.
AD-629 229 FLD. 6/9

•LEAST SQUARES METHOD
OPTIMIZATION
AN IMPROVED STEPWISE REGRESSION ANALYSIS PROCEDURE.
AD-629 928 FLD. 12/1

•LIBRARIES
GUIDED MISSILES(UNDERWATER-TO-SURFACE
CENTER FOR ANALYSIS OF INFORMATION ON THE SUBMARINELAUNCHED MISSILE: DEFINITION OF REQUIREMENTS.
AD-629 193 FLD. 5/2

SCIENTIFIC RESEARCH
SCIENTIFIC JOURNALS: AVAILABILITY OF RESEARCH SPONSOREDBY OFFICE OF AEROSPACE RESEARCH.
AD-629 909 FLD. 5/2

VOCABULARY
LIST OF ACRONYMS AND ABBREVIATIONS USED IN THE MCDONNELLAIRCRAFT TECHNICAL LIBRARY.
AD-629 208 FLD. 5/2

•LIFE SUPPORT
OXYGEN EQUIPMENT
DESIGN OF A TEST MODEL FOR A SOLID ELECTROLYTE CARBONDIOXIDE REDUCTION SYSTEM.
AD-629 982 FLD. 6/11

PHOTOSYNTHESIS
LIFE SUPPORT SYSTEMS, PHOTOSYNTHESIS: ANALYTICALSURVEY.
AD-629 269 FLD. 6/11

•LIGHT
PRODUCTION
PRODUCTION OF VISIBLE LIGHT BY THE THORIA-CERIA MANTLE;PHYSICAL CHARACTERISTICS AND A PROPOSED THEORY OF THEOCCURRING MECHANISMS AND PROCESSES.
AD-629 008 FLD. 7/4

•LIGHT COMMUNICATION SYSTEMS
DEMODULATORS
MICROWAVE OPTICAL RECEIVER TECHNIQUES.
AD-629 382 FLD. 17/2

•LIGHT TRANSMISSION
ATMOSPHERE
DESCRIPTION OF MONTE CARLO CODES FOR STUDYING LIGHTTRANSPORT IN THE ATMOSPHERE.
AD-629 115 FLD. 20/6
MONTE CARLO CODES FOR STUDY OF LIGHT TRANSPORT IN THEATMOSPHERE. VOLUME II: UTILIZATION INSTRUCTIONS.
AD-629 116 FLD. 20/6

CRYSTALS
TRANSLATION OF RUSSIAN RESEARCH: ON THE THEORY OF THECONVERSION OF THE FREQUENCY OF LIGHT WAVES BY A CRYSTAL.
AD-629 311 FLD. 20/6

•LINEAR PROGRAMMING
GRAPHICS
REPRINT: SURFACE DUALITY OF LINEAR GRAPHS.
AD-629 904 FLD. 12/2

OPTIMIZATION
PRIMAL-DUAL DECOMPOSITION PROGRAMMING.
AD-629 369 FLD. 12/2

•LINEAR SYSTEMS
SYNTHESIS
REPRINT: SYNTHESIS METHOD FOR LINEAR TIME-VARYING SYSTEMS.
AD-629 983 FLD. 9/2

•LIPIDS
SENDAI VIRUS
TRANSLATION OF RUSSIAN RESEARCH: GAS-LIQUIDCHROMATOGRAPHY OF METHYL ETHERS OF HIGHER FATTY ACIDSOF SENDAI VIRUS LIPID COMPONENT.
AD-629 626 FLD. 6/1

•LIQUIFIED GASES
JET ENGINE FUELS
THERMAL PROTECTION FOR LIQUID-HYDROGEN FUEL TANKS INHIGH-SPEED, LONG-RANGE AIRCRAFT.
AD-629 907 FLD. 21/4

•LITHIUM
X-RAY SPECTRUM
REPRINT: SOFT X-RAY EMISSION SPECTRUM OF LITHIUM.
AD-629 996 FLD. 20/2

•LITHIUM COMPOUNDS
SPECTRA(INFRARED)
INFRARED SPECTRA OF POLYATOMIC HIGH-TEMPERATUREMOLECULES: LITHIUM FLUORIDE AND LITHIUM CHLORIDE VAPORIZATION SPECIES.
AD-629 049 FLD. 7/2

•LOADING(MECHANICS)
ALUMINUM
ELASTIC-PLASTIC PULSE PROPAGATION IN ALUMINUM RODS ATELEVATED TEMPERATURES.
AD-629 968 FLD. 20/11

IMPACT TESTS
RESPONSE OF A BEAM TO AN IMPACT LOADING.
AD-629 991 FLD. 20/11

STRUCTURAL PARTS
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL INVESTIGATIONOF THE INFLUENCE OF LOAD ALTERNATION ON THE FATIGUE STRENGTHAND LONGEVITY OF COMPONENTS WITH AND WITHOUT STRESSCONCENTRATION. COMMUNICATION II.
AD-629 147 FLD. 20/11

•LORAN EQUIPMENT
PERFORMANCE(ENGINEERING)
EVALUATION OF PROPOSED MODIFICATIONS TO THE AN/UPN-19SERIES LORAN C RECEIVERS.
AD-629 114 FLD. 17/7

•LUBRICANT ADDITIVES
WEAR RESISTANCE
TRANSLATION OF RUSSIAN PATENT, ANTIWEAR ADDITIVE FORLUBRICATING OILS.
AD-629 053 FLD. 11/8

•LUBRICANTS
FLUID FLOW
REPRINT: FREE BOUNDARY PROBLEMS FOR VISCOUS FLOWS INCHANNELS.
AD-629 862 FLD. 20/4

HOT WORKING
TRANSLATION OF A RUSSIAN PATENT: METHOD OF OBTAININGLUBRICANT FOR HOT WORKING OF METALS.
AD-629 000 FLD. 11/8

TITANIUM
TRANSLATION OF A RUSSIAN PATENT: METHOD OF OBTAININGLUBRICANT FOR TITANIUM PARTS.
AD-629 160 FLD. 11/8

VAPORS
TRANSLATION OF RUSSIAN RESEARCH: DETERMINING THEELASTICITY OF SATURATED VAPORS OF LUBRICATING MATERIALS.
AD-629 199 FLD. 11/8

•LUBRICATION
HALOCARBON PLASTICS
TRANSLATION OF RUSSIAN RESEARCH: FILLED FLUOROCARBONPLASTICS AS ANTIFRICTION AND CHEMICALLY STABLE MATERIALSFOR CHEMICAL MACHINE BUILDING.
AD-629 092 FLD. 11/9

MATERIAL FORMING
METALWORKING PROCESSES AND EQUIPMENT.
AD-629 049 FLD. 13/8

•LUMINESCENCE
ATMOSPHERE
NUMERICAL ESTIMATES OF LUMINANCE AND TOTAL BRIGHTNESS OFTHE TERRESTRIAL HALO.
AD-629 233 FLD. 4/1

•LUNAR SURFACE VEHICLES
FUEL CONSUMPTION
MINIMUM FUEL TRAJECTORIES FOR THRUST LIMITED ROCKETS INAN ADVERSE SQUARE GRAVITY FIELD.
AD-629 398 FLD. 22/2

STATE-OF-THE-ART REVIEWS
LUNAR SURFACE VEHICLES, A BRIEF REVIEW OF CURRENT DESIGNCONCEPTS.
AD-629 350 FLD. 13/6

•LUNER ENVIRONMENT
SIMULATION
REPRINT: AN ATTEMPT TO REDUCE THE GAS LOAD IN AN ULTRAHIGHVACUUM CHAMBER.
AD-629 132 FLD. 14/2

•LYMPHATIC SYSTEM
IMMUNITY
TRANSLATION OF RUSSIAN RESEARCH: IMMUNOLOGICAL ACTIVITYOF LYMPHOID ORGANS DURING AEROSOL AND SUBCUTANIOUSTYPHOID IMMUNIZATION.
AD-629 631 FLD. 6/13

•MACHINE TOOLS
ULTRASONIC RADIATION
TRANSLATION OF RUSSIAN RESEARCH: ULTRASONIC MACHINE TOOL.
AD-629 147 FLD. 13/9

•MACHINES
RELIABILITY
TRANSLATION OF RUSSIAN RESEARCH: CALCULATING THEINTERDEPENDENCE OF MACHINE SUBASSEMBLIES IN DETERMININGRELIABILITY.
AD-629 301 FLD. 14/9

WELDING
DEVELOPMENT OF EQUIPMENT FOR AUTOMATIC NARROW-GAPWELDING FOR SHIPYARD USE.
AD-629 919 FLD. 13/9

•MACHINING
ELECTRON BEAMS
ELECTRON BEAM TECHNIQUES FOR FABRICATION AND ASSEMBLYOF PARTS FOR ELECTRON TUBES.
AD-629 979 FLD. 13/8

•MAGNESIUM COMPOUNDS
OXIDES
REPRINT: POINT DEFECTS IN MAGNESIUM OXIDE.
AD-629 990 FLD. 20/12

•MAGNETIC CORE STORAGE
COMPUTER LOGIC
TRANSLATION OF RUSSIAN PATENT: METHOD OF COLLECTINGINFORMATION IN A LONG TERM MEMORY DEVICE.
AD-629 240 FLD. 9/2

•MAGNETIC FIELDS
SOLAR SYSTEMS
REPRINT: SOLAR SYSTEM MAGNETIC FIELDS AND PLASMAS.
AD-629 178 FLD. 3/2

•MAGNETIC PROPERTIES
PRESSURE
EFFECTS OF PRESSURE ON MAGNETIC INTERACT-IONS.
AD-629 986 FLD. 20/3

VANADIUM COMPOUNDS
MAGNETIC ORDERING IN VF2.
AD-629 211 FLD. 7/4

•MAGNETIC RECORDING SYSTEMS
SEISMOLOGY
EXPLORATORY MEETING ON THE MAGNETIC TAPE RECORDINGOF SEISMIC DATA.
AD-629 199 FLD. 17/10

•MAGNETOHDRODYNAMICS
GEOPHYSICS
STUDIES OF THE DYNAMO ACTION OF THE LIQUID CORE OF THE EARTH.
AD-629 497 FLD. 8/14

•MAGNETOHYDRODYNAMIC GENERATORS
GAS FLOW
TRANSLATION OF RUSSIAN RESEARCH: RADIAL FLOW OF ANELECTROCONDUCTIVE GAS IN A MOVING MAGNETIC FIELD.
AD-629 913 FLD. 10/2

PLASMA PHYSICS
POWER GENERATION THROUGH THE INTERACTION OF PLASMA FLOWSAND MAGNETIC FIELDS.
AD-629 979 FLD. 10/2

•MAGNETOHYDRODYNAMICS
ELECTRIC POWER PRODUCTION
INTENTIONAL COMBUSTION OSCILLATIONS IN PROPULSION SYSTEMS.
AD-629 499 FLD. 21/8
POWER GENERATION THROUGH THE INTERACTION OF PLASMA FLOWSAND MAGNETIC FIELDS.
AD-629 979 FLD. 10/2

GAS IONIZATION
HYDROMAGNETIC IONIZING WAVES.
AD-629 171 FLD. 20/9

HAMILTONIAN
LORENTZ INVARIANCE, MOMENTUM-ENERGY TENSORS, AND THEM H D PROBLEM.
AD-629 268 FLD. 20/9

•MAGNETRONS
ANODES(ELECTRON TUBES)
REPRINT: ANODE STRUCTURES FOR COLD-CATHODE HIGH-POWERMAGNETRONS.
AD-629 989 FLD. 9/1

•MAINTENANCE EQUIPMENT
CALIBRATION
STANDARDIZED TRANSDUCER CALIBRATION SYSTEM FOR NAVALSHIPYARD TRANSDUCER REPAIR FACILITIES.
AD-629 926 FLD. 14/2

•MANAGEMENT ENGINEERING
PRODUCTION
EFFICIENT ACHIEVEMENT OF RAPID TECHNOLOGICAL PROGRESSA MAJOR NEW PROBLEM IN PUBLIC FINANCE.
AD-629 972 FLD. 5/1

•MANAGEMENT PLANNING
SYSTEMS ENGINEERING
SYSTEM VIEW AND THE DISENCHANTED EXECUTIVE.
AD-629 002 FLD. 5/1

•MANGANESE COMPOUNDS
SULFATES
REPRINT: EFFECT OF PRESSURE ON THE DISSOCIATION OFMANGANESE SULFATE ION PAIRS IN WATER.
AD-629 985 FLD. 7/4

•MAN-MACHINE SYSTEMS
EDUCATION
DESIGN OF MAN-MACHINE SYSTEMS IN EDUCATION.
AD-629 992 FLD. 5/9

GRAPHICS
GRAPHICS: MAN-MACHINE COMMUNICATIONS.
AD-629 967 FLD. 5/8

SPECIAL PURPOSE COMPUTERS
ADVANCED DYNAMIC ATTRIBUTE EXTRACTION TECHNIQUES.
AD-629 181 FLD. 9/2

•MAPPING
RADAR
RADAR AND GEOLOGY.
AD-629 887 FLD. 8/2

•MAPPING(TRANSFORMATIONS)
GROUPS(MATHEMATICS)
STRUCTURE AND AUTOMORPHISMS OF FINITE AUTOMATA.
AD-629 239 FLD. 9/2

•MARINE ENGINEERING
PLASTICS
TRANSLATION OF RUSSIAN RESEARCH: PLASTIC MARINE FITTINGS.
AD-629 619 FLD. 13/10

•MARINE GEOLOGY
CALIFORNIA
REPRINT: STRUCTURE OF THE CONTINENTAL MARGIN OFF CENTRALCALIFORNIA.
AD-629 949 FLD. 8/7

RARE EARTH ELEMENTS
RARE EARTH DISTRIBUTIONS IN THE MARINE ENVIRONMENT.
AD-629 347 FLD. 8/5

•MARINE METEROLOGY
WEST INDIES
HEAT FLUX AND SURFACE STRESS ON AND NEAR AN ISLAND IN THETRADE WIND REGION.
AD-629 180 FLD. 4/2

•MASERS
AMMONIA
TRANSLATION OF A RUSSIAN PATENT: AMMONIA MASER(AMMONIA MOLECULAR GENERATOR).
AD-629 196 FLD. 20/5

MATERIALS
REPRINT: PARAMAGNETIC RESONANCE OF TRIVALENT FE57 INDOUBLE NITRATE CRYSTALS.
AD-629 872 FLD. 7/4

PUMPING(OPTICAL)
REPRINT: THE EFFECTS OF OPTICAL PUMPING ON THE RB87MASER OSCILLATOR.
AD-629 925 FLD. 20/5

•MASS DESTRUCTION WEAPONS
DEFENSE SYSTEMS
TRANSLATION OF RUSSIAN REPORT: MILITARY TRAINING INPROTECTION FROM MASS-DESTRUCTION WEAPONS.
AD-629 192 FLD. 5/9

•MASS NUMBER
ELEMENTARY PARTICLES
REPRINT: MASS FORMULA IN THE COVARIANT SPIN-UNITARY SPINSCHEME.
AD-629 961 FLD. 20/8

•MASS TRANSFER
ATMOSPHERIC MOTION
TRANSLATION OF RUSSIAN RESEARCH: HEAT MASS TRANSFER.
AD-629 066 FLD. 4/1

•MATERIALS
ENERGY CONVERSION
MATERIALS FOR HIGH-TEMPERATURE ENERGY CONVERTERS: ANNOTATED BIBLIOGRAPHY BASED ON SOVIET OPEN-SOURCE MATERIALS.
AD-625 198 FLD. 10/1

GAS BEARINGS
EVALUATION OF FRICTION AND WEAR CHARACTERISTICS OFMATERIALS FOR GAS-LUBRICATED BEARINGS UNDER CONDITIONSOF START-STOP, AND WHIRL INDUCED RUBBING.
AD-625 376 FLD. 13/9

•MATHEMATICAL LOGIC
INFORMATION THEORY
SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.
AD-625 488 FLD. 12/1

•MATHEMATICAL MODELS
AERODYNAMICS
A FLOW MODEL AND ANALYSIS OF A ROCKET PAIR IN CLOSEPROXIMITY.
AD-625 566 FLD. 19/4

ANALYSIS OF VARIANCE
BAYESIAN COMPARISON OF MEANS OF A MIXED MODEL WITHAPPLICATION TO REGRESSION ANALYSIS.
AD-625 271 FLD. 12/1

MINIMAX TECHNIQUE
REPRINT: MINIMAX DETECTION STATION PLACEMENT.
AD-625 135 FLD. 19/7

PERFORMANCE(ENGINEERING)
METHOD FOR ESTIMATING THE CATAPULT PERFORMANCE OF ACARRIER-BASED AIRPLANE.
AD-624 930 FLD. 1/3

PSYCHOMETRICS
MODEL FOR THE GENERALIZABILITY OF TESTS CONSTRUCTED BYSTRATIFIED SAMPLING.
AD-624 901 FLD. 5/10

•MATHEMATICAL PROGRAMMING
MANAGEMENT PLANNING
APPLICATION OF CHANCE-CONSTRAINED PROGRAMMING TOSOLUTION OF THE SO-CALLED 'SAVINGS AND LOAN ASSOCIATION'TYPE OF PROBLEM.
AD-625 050 FLD. 12/2

•MATRIX ALGEBRA
GRAPHICS
REPRINT: LEHMAN'S SWITCHING GAME AND A THEOREM OFTUTTE AND NASH-WILLIAMS.
AD-625 906 FLD. 12/2

•MATRIX ALGEBRA
ASTRONOMICAL GEODESICS
REDUCTION PROCEDURES FOR ABSOLUTE DIRECTION AND GEODETICAZIMUTHS FROM OPTICAL OBSERVATIONS OF SATELLITES.
AD-625 356 FLD. 8/4

SET THEORY
REPRINT: MINIMUM PARTITION OF A MATROID INTO INDEPENDENTSUBSETS.
AD-625 909 FLD. 12/2

•MEASURING DEVICES(ELECTRICAL + ELECTRO
ELECTRIC CURRENTS
REPRINT: TRANSISTORIZED CATHODE-RAY PHASE-SENSITIVENULL DETECTOR.
AD-624 937 FLD. 9/3

•MECHANICAL WAVES
FERROMAGNETIC MATERIALS
REPRINT: AMPLIFICATION OF MAGNETOELASTIC WAVES INYTTRIUM IRON GARNET AT 300K.
AD-624 981 FLD. 20/12

PROPAGATION
TRANSLATION OF RUSSIAN RESEARCH: REFLECTION OFSPHERICAL ELASTIC WAVE FROM THE BOUNDARY OF SEMISPACE.
AD-624 929 FLD. 20/11
HARMONIC WAVE PROPAGATION IN ELASTIC RODS OF ELLIPTICALCROSS-SECTION.
AD-625 408 FLD. 20/11
ELASTIC-PLASTIC PULSE PROPAGATION IN ALUMINUM RODS ATELEVATED TEMPERATURES.
AD-625 468 FLD. 20/11

•MECHANICAL WORKING
METALS
METALWORKING PROCESSES AND EQUIPMENT.
AD-625 049 FLD. 13/8

•MEMBRANES
SEMIPERMEABILITY
ELECTRICAL PROPERTIES OF SEMIPERMEABLE MEMBRANES.
AD-625 470 FLD. 7/4

•MERCHANT VESSELS
WAKE
WAKE ANALYSIS OF SHIP MODELS; SINGLE-SCREW MERCHANTTYPE.
AD-625 327 FLD. 13/10

•MESON REACTIONS
ELECTRONS
REPRINT: SPONTANEOUS SYMMETRY BREAKDOWN AND THE MU-EGAMMA INTERACTION.
AD-625 963 FLD. 20/8

•MESON SCATTERING
NUCLEAR ISOBARS
REPRINT: MODIFIED ISOBAR APPROXIMATION FOR PI-RHOSCATTERING.
AD-624 950 FLD. 20/8

WAVE FUNCTIONS
REPRINT: NUMERICAL SOLUTION OF FIXED-SOURCE FIELDTHEORIES.
AD-625 597 FLD. 20/10

•METAL PLATES
ALUMINUM ALLOYS
FRACTURE TOUGHNESS, FATIGUE-CRACK PROPAGATION ANDCORROSION CHARACTERISTICS OF ALUMINUM ALLOY PLATESFOR WING SKINS.
AD-625 459 FLD. 11/6

•METALLIC COMPOUNDS
BORIDES
HEATS OF FORMATION OF METALLIC BORIDES BY FLUORINE BOMBCALORIMETRY.
AD-625 336 FLD. 7/4

•METALLIC CRYSTALS
CRYSTAL STRUCTURE
TRANSLATION OF RUSSIAN RESEARCH. MOSIAC STRUCTURE OFMETALLIC POLYCRYSTALS AND EXTINCTION EFFECTS.
AD-625 249 FLD. 20/2

•METALORGANIC COMPOUNDS
ACETONES
REPRINT: CRYSTAL STRUCTURE OF TETRAMERIC COBALT(II)ACETYLACETONATE.
AD-625 693 FLD. 7/4

FILMS
TRANSLATION OF RUSSIAN RESEARCH. A CHEMICAL REACTIONPRODUCES A MICROCIRCUIT OF FILMS FROM CARBONYLS OFMETALS.
AD-625 277 FLD. 9/1

PERCHLORATES
REPRINT: CRYSTAL AND MOLECULAR STRUCTURE OF PENTAKIS(METHYLISONITRILE)COBALT(I) PERCHLORATE.
AD-625 639 FLD. 7/4

TIN COMPOUNDS
REPRINT: SYNTHESIS AND PROPERTIES OF ORGANIC TINHYDROPEROXIDES.
AD-625 649 FLD. 7/3

•METALS
CRYSTAL LATTICE DEFECTS
TRANSLATION OF RUSSIAN RESEARCH: STRUCTURAL IMPERFECTIONSOF METALS DURING RECRYSTALLIZATION.
AD-625 154 FLD. 11/6

PURIFICATION
HIGH-PURITY METALS: ANNOTATED BIBLIOGRAPHY BASED ONSOVIET AND SOVIET-BLOC OPEN-SOURCE MATERIAL.
AD-624 997 FLD. 11/6

•METEORITES
PETROLOGY
REPRINT: SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARYCHONDRITES.
AD-625 165 FLD. 8/7

•METEOROLOGICAL INSTRUMENTS
PROBES
MEASUREMENT OF WIND SHEAR.
AD-625 335 FLD. 4/2

RADIOMETERS
REPRINT: APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY.
AD-624 998 FLD. 4/2

SOUNDING ROCKETS
SOUNDING ROCKET: DESIGN, DEVELOPMENT AND FLIGHT TESTRESULTS OF THE LOKI INSTRUMENTED DART SYSTEM.
AD-625 981 FLD. 4/2

•METEOROLOGICAL PARAMETERS
NUMERICAL ANALYSIS
ATMOSPHERIC SOUNDING: OBJECTIVE CROSS-SECTION ANALYSIS.
AD-625 137 FLD. 4/1

•MICROMETEOROLOGY
ATMOSPHERIC MOTION
TRANSLATION OF RUSSIAN RESEARCH: THE STRUCTURE OF THEFIELDS OF WIND-VELOCITY AND TEMPERATURE IN THE SURFACELAYER OF THE ATMOSPHERE.
AD-625 621 FLD. 4/2

•MICROMINIATURIZATION(ELECTRONICS)
AMPLIFIERS
MICROELECTRONIC AMPLIFIERS HAVING MINIMUM SENSITIVITYTO ARBITRARY PARAMETER CHANGES.
AD-625 379 FLD. 9/1

DISPLAY SYSTEMS
MICROELECTRONIC SOLID-STATE DISPLAY ASSEMBLY.
AD-625 370 FLD. 9/5

METALORGANIC COMPOUNDS
TRANSLATION OF RUSSIAN RESEARCH. A CHEMICAL REACTIONPRODUCES A MICROCIRCUIT OF FILMS FROM CARBONYLS OFMETALS.
AD-625 277 FLD. 9/1

SYMPOSIA
CONFERENCE ON THE NAVY MICROELECTRONICS PROGRAM (3RD), AT THE U. S. NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIFORNIA, APRIL 5, 6, 7, 1965.
AD-625 007 FLD. 9/1

•MICROORGANISMS
AIR
TRANSLATION OF RUSSIAN RESEARCH: FREEING THE AIR OFMICROFLORA UNDER THE ACTION OF ARTIFICIAL

AEROIONIZATION.
AD-629 659 FLD. 6/13

EXCRETION
RECOVERY OF SPECIFIC MICROORGANISMS FROM URINE ANDFECES OF INFECTED ANIMALS.
AD-629 296 FLD. 6/13

•MICROWAVE AMPLIFIERS
CROSSED FIELD DEVICES
RESEARCH ON CROSSED-FIELD ELECTRON DEVICES.
AD-629 938 FLD. 9/1

•MICROWAVE COMMUNICATION SYSTEM
LIGHT COMMUNICATION SYSTEMS
MICROWAVE OPTICAL RECEIVER TECHNIQUES.
AD-629 382 FLD. 17/2

•MICROWAVE OSCILLATORS
VARACTOR DIODES
REPRINT: MICROWAVE GENERATION FROM AVALANCHINGVARACTOR DIODES.
AD-629 996 FLD. 9/5

•MICROWAVE SPECTROSCOPY
SPECTRUM ANALYZERS
DIELECTRIC DISPERSION.
AD-629 609 FLD. 7/4

•MICROWAVES
DIFFRACTION
REPRINT: MICROWAVE MEASUREMENTS OF PARTIALLY COHERENTFIELDS.
AD-629 128 FLD. 20/14

NOISE GENERATORS
TRANSLATION OF CHINESE RESEARCH: MICROWAVE NOISESOURCE OF GAS DISCHARGE FOR CIRCULAR WAVEGUIDES.
AD-629 261 FLD. 9/5

•MILITARY FACILITIES
DISTRIBUTION
REPRINT: MINIMAX DETECTION STATION PLACEMENT.
AD-629 139 FLD. 19/7

•MILITARY TRAINING
MASS DESTRUCTION WEAPONS
TRANSLATION OF RUSSIAN REPORT: MILITARY TRAINING INPROTECTION FROM MASS-DESTRUCTION WEAPONS.
AD-629 192 FLD. 5/9

•MILLIMETER WAVES
ANTENNAS
AFCRL 29-FT MILLIMETER-WAVE ANTENNA.
AD-629 170 FLD. 9/5

•MINERALS
METEORITES
REPRINT: SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARYCHONDRITES.
AD-629 148 FLD. 8/7

•MIXERS(ELECTRONICS)
MICROWAVE EQUIPMENT
TRANSLATION OF RUSSIAN PATENT: BALANCED MIXER.
AD-629 287 FLD. 9/1

•MIXTURES
DETONATION WAVES
FORMATION OF DETONATION WAVES IN COMBUSTIBLE GASEOUSMIXTURES.
AD-629 989 FLD. 19/9

•MODELS(SIMULATIONS)
BEHAVIOR
FAMILY OF COMPLEX SYSTEMS AS A MODEL OF ORGANISMS'BEHAVIOR.
AD-629 869 FLD. 6/9

•MOLECULAR BEAMS
ATOMIC CLOCKS
REPRINT: CESIUM-BEAM FREQUENCY STANDARD FOR DEFININGAN ATOMIC SECOND AND AN ATOMIC TIME SCALE.
AD-629 976 FLD. 14/2

•MOLECULAR ORBITALS
ALKALI METALS
DIFFERENT BANDS FOR DIFFERENT SPINS: COHESIVE ENERGY OFALKALI METALS: LINEAR CHAIN OF HYDROGEN ATOMS. CRYSTALINTEGRALS AND MOLECULAR INTEGRALS.
AD-629 911 FLD. 7/4

MATHEMATICAL MODELS
INDEPENDENT PARTICLE MODEL FOR MANY-ELECTRON SYSTEM.SYMMETRY PROPERTIES AND CRITERIA FOR THE VALIDITY OF THEINDEPENDENT PARTICLE MODEL.
AD-629 213 FLD. 7/4

POTENTIAL THEORY
INTERACTION POTENTIAL SURFACE FOR TRIATOMIC HYDROGEN.
AD-629 214 FLD. 7/4

•MOLECULAR STRUCTURE
METALORGANIC COMPOUNDS
REPRINT: CRYSTAL AND MOLECULAR STRUCTURE OF PENTAKIS(METHYLISONITRILE)COBALT(I) PERCHLORATE.
AD-629 639 FLD. 7/4

TANTALUM COMPOUNDS
REPRINT: ANALYSIS OF THIN FILMS OF TANTALUM REACTIVELYSPUTTERED IN NITROGEN ATMOSPHERE.
AD-629 989 FLD. 7/2

•MOLYBDENUM ALLOYS
ARSENIC ALLOYS
REPRINT: THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM.
AD-629 967 FLD. 11/6

COPPER ALLOYS
TRANSLATION OF RUSSIAN RESEARCH: MUTUAL SOLUBILITY OFCOPPER AND MOLYBDENUM AND CERTAIN PROPERTIES OF ALLOYS OFMOLYBDENUM WITH COPPER.
AD-629 908 FLD. 11/6

•MOMENTUM
OPERATORS(MATHEMATICS)
REPRINT: TRANSFORMATION FROM A LINEAR MOMENTUM TO ANANGULAR MOMENTUM BASIS FOR RELATIVISTIC PARTICLES OF NONZERO MASS AND ANY SPIN.
AD-629 869 FLD. 20/10

•MONOCYCLIC COMPOUNDS
ALKYLATION
REPRINT: ALKYLATIONS OF PHENYLACETIC, ALPHA-ALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERS BY MEANS OF SODAMIDEAND SODIUM HYDRIDE.
AD-629 629 FLD. 7/3

•MONTE CARLO METHOD
LIGHT TRANSMISSION
DESCRIPTION OF MONTE CARLO CODES FOR STUDYING LIGHTTRANSPORT IN THE ATMOSPHERE.
AD-629 119 FLD. 20/6

PROGRAMMING(COMPUTERS)
MONTE CARLO CODES FOR STUDY OF LIGHT TRANSPORT IN THEATMOSPHERE. VOLUME II: UTILIZATION INSTRUCTIONS.
AD-629 116 FLD. 20/6

•MOTION SICKNESS
VISUAL PERCEPTION
REPRINT: PERCEPTUAL VERTIGO: A DIMENSIONAL STUDY.
AD-629 929 FLD. 6/19

•MOTIVATION
BEHAVIOR
SOCIAL MOTIVES AND DECISION-MAKING BEHAVIOR IN INTERPERSONAL SITUATIONS.
AD-629 987 FLD. 5/10

•MOTOR REACTIONS
CONTROL SYSTEMS
UPPER EXTREMITY PROSTHETICS RESEARCH. HUMAN TRACKING.SENSORY MOTOR CONTROL. MYOELECTRIC CONTROL.
AD-629 990 FLD. 6/5

•MULTIPLEX
COMMUNICATION EQUIPMENT
MULTIPLEXER SET AN/FCC-17( ) AND MULTIPLEXER SETAN/MCC-12.
AD-629 949 FLD. 9/5

•MULTIVARIATE ANALYSIS
REVIEWS
MISSING VALUES IN MULTIVARIATE STATISTICS. REVIEW OF THELITERATURE.
AD-629 269 FLD. 12/1

•MUSCLES
ELECTROPHYSIOLOGY
UPPER EXTREMITY PROSTHETICS RESEARCH. HUMAN TRACKING.SENSORY MOTOR CONTROL. MYOELECTRIC CONTROL.
AD-629 990 FLD. 6/5

•NAVAL PERSONNEL
SELECTION
VALIDITY OF THE ADVANCED TECHNICANS TEST IN PREDICTINGPERFORMANCE AT CLASS 'B' AND 'C' SCHOOLS.
AD-629 119 FLD. 5/9

•NAVAL RESEARCH
MICROMINIATURIZATION(ELECTRONICS)
CONFERENCE ON THE NAVY MICROELECTRONICS PROGRAM (3RD),AT THE U. S. NAVAL POSTGRADUATE SCHOOL, MONTEREY,CALIFORNIA, APRIL 5, 6, 7, 1965.
AD-629 007 FLD. 9/1

•NAVAL RESEARCH LABORATORIES
INSTRUMENTATION
INSTRUMENT STANDARDS.
AD-629 923 FLD. 14/2

•NAVAL TRAINING
OPERATIONS RESEARCH
SYSTEMS ANALYSIS OF NAVAL ANTI-AIR WARFARE TRAININGREQUIREMENTS.
AD-629 378 FLD. 5/9

•NAVIGATION CHARTS
RADIO NAVIGATION
OMEGA NAVIGATIONAL SYSTEM CONDUCTIVITY MAP.
AD-629 490 FLD. 17/7

•NERVE IMPULSES
PROBABILITY
SPIKE PROBABILITIES IN NEURONES: INFLUENCE OF TEMPORALSTRUCTURE IN THE TRAIN OF SYNAPTIC EVENTS.
AD-629 910 FLD. 6/5

•NERVES
PROSTHETICS
TRANSLATION OF RUSSIAN ARTICLE: PROSTHESIS OF NERVES.
AD-629 291 FLD. 6/5

•NETWORKS
SYNTHESIS
REPRINT: UNIFIED THEORY OF SYNTHESIS WITH UNSYMMETRICFOUR-ELEMENT LOSSLESS LATTICES.
AD-629 976 FLD. 9/5

TOPOLOGY
ELEMENTARY COMPLETE TREE

TRANSFORMATION.
AD-629 201 FLD. 9/1

•NEUTRON ABSORPTION
ATMOSPHERE
REPRINT: NEUTRON MONITOR MASS ABSORPTION COEFFICIENTSAT CHICAGO AND CLIMAX DURING SOLAR CYCLE 19 (1954-1963).
AD-629 600 FLD. 4/1

•NEUTRON CAPTURE
IRON
REPRINT: FE54(N,P), (N,ALPHA), AND (N,2N) CROSS SECTIONS.
AD-629 980 FLD. 20/8

•NEUTRON SPECTRUM
BISMUTH
NEUTRON SPECTRA FROM MONOENERGETIC PHOTONS OF BISMUTH.
AD-629 963 FLD. 20/8

•NEUTRONS
SOURCES
PHYSICS AND SHIELDING OF HETEROGENEOUS ISOTOPIC NEUTRONSOURCES.
AD-629 406 FLD. 18/2
VARIABLE INTENSITY ISOTOPIC SOURCES.
AD-629 419 FLD. 18/2

•NICKEL
OPTICAL PROPERTIES
OPTICAL PROPERTIES OF COPPER NICKEL, AND A SERIES OFCOPPER-NICKEL ALLOYS.
AD-629 371 FLD. 11/6

•NICKEL COMPOUNDS
RELAXATION TIME
RELAXATION OF DILUTED NICKEL FLUOSILICATE AT LOW TEMPERATURESBY STEADY-STATE RESONANCE ABSORPTION TECHNIQUES.
AD-629 944 FLD. 20/12

•NIOBIUM
RADIATION DAMAGE
POINT DEFECTS AND MECHANICAL PROPERTIES OF COLUMBIUM.
AD-629 479 FLD. 11/6

•NITRILES
FREE RADICALS
REPRINT: ABSORPTION SPECTRUM OF THE CCN RADICAL.
AD-629 968 FLD. 7/4

•NITROGEN COMPOUNDS
FLUORIDES
GENERATION OF THE FO RADICAL AND PRESSURE REACTIONS OFDIFLUORODIAZINE.
AD-629 928 FLD. 7/2

OXIDES
REPRINT: ELECTRON-ION RECOMBINATION IN NITRICOXIDE IN THE TEMPERATURE RANGE 196 TO 398K.
AD-629 110 FLD. 7/4
HIGH RESOLUTION ECHELLE VACUUM SPECTROGRAPH APPLIED TOMEASUREMENT OF MOLECULAR CONSTANTS OF THE 1Σ() STATEOF NO().
AD-629 337 FLD. 20/6

SYNTHESIS(CHEMISTRY)
STUDIES OF LOW-TEMPERATURE OXIDATION REACTIONS.
AD-629 307 FLD. 7/2

•NOISE
AERODYNAMIC CHARACTERISTICS
ASPECTS OF JET FLOWS AND EDGETONES.
AD-629 086 FLD. 20/4

NAVAL EQUIPMENT
SPEECH INTERFERENCE ASPECTS OF NAVY NOISES. CALCULATIONSSHOW SPEECH INTERFERENCE MEASUREMENTS ARE SIMPLIFIEDBY AVERAGING SOUND PRESSURE LEVELS IN MID-FREQUENCYOCTAVES.
AD-629 262 FLD. 5/5

•NOISE GENERATORS
GAS DISCHARGES
TRANSLATION OF CHINESE RESEARCH: MICROWAVE NOISESOURCE OF GAS DISCHARGE FOR CIRCULAR WAVEGUIDES.
AD-629 261 FLD. 9/5

•NOISE(RADIO)
CROSSED FIELD DEVICES
RESEARCH ON CROSSED-FIELD ELECTRON DEVICES.
AD-629 438 FLD. 9/1

•NONLINEAR DIFFERENTIAL EQUATIONS
ANALOG COMPUTERS
ANALOG COMPUTER STUDY OF VAN DER POL'S EQUATION AND ITSRESPONSE TO WHITE GAUSSIAN NOISE.
AD-629 372 FLD. 12/1

•NON-DESTRUCTIVE TESTING
ULTRASONIC RADIATION
TRANSLATION OF RUSSIAN RESEARCH: ULTRASONICDEFECTOSCOPY OF TUBES.
AD-629 229 FLD. 13/8

•NOZZLE GAS FLOW
EQUATIONS
TRANSLATION OF RUSSIAN RESEARCH: PASSAGE OF AN UNBALANCEDGAS THROUGH THE CRITICAL SECTION OF A NOZZLE.
AD-629 068 FLD. 20/4

•NUCLEAR ENERGY LEVELS
INTEGRAL EQUATIONS
COUPLING BETWEEN THE ENERGY GAP AND SINGLE PARTICLEENERGY FOR NUCLEAR MATTER.
AD-629 398 FLD. 20/8

RELATIVITY THEORY
REPRINT: RELATIVISTIC SUPERMULTIPLET THEORIES.
AD-629 573 FLD. 20/8

•NUCLEAR EXPLOSION DAMAGE
FIRE SAFETY
BLAST AND IMPACT EXPOSURE OF EXISTING STRUCTURAL FIREPROTECTION SCHEMES.
AD-629 040 FLD. 13/12

•NUCLEAR EXPLOSIONS
DETECTION
EFFECTS OF PROPAGATION ON THE HIGH-FREQUENCY ELECTROMAGNETIC RADIATION FROM LOW-ALTITUDE NUCLEAR EXPLOSIONS.
AD-629 074 FLD. 18/3
SIMPLIFIED NORMAL MODE TREATMENT OF LONG-PERIODACOUSTIC-GRAVITY WAVES IN THE ATMOSPHERE.
AD-629 232 FLD. 17/1
ARRAY RESEARCH.
AD-629 996 FLD. 8/11

•NUCLEAR MAGNETIC RESONANCE
FLUORIDES
REPRINT: EXCHANGE REACTIONS IN THE SYSTEM BORON TRIFLUORIDEMETHANOL.
AD-629 969 FLD. 7/4

•NUCLEAR MODELS
GROUPS(MATHEMATICS)
REPRINT: A MODEL REQUIRING LIE GROUP SYMMETRIES.
AD-629 358 FLD. 20/8

•NUCLEAR PHYSICS
REPORTS
RESEARCH IN NUCLEAR PHYSICS.
AD-629 210 FLD. 20/8

•NUCLEAR PROPERTIES
MAGNETISM
REPRINT: NUCLEAR MAGNETISM.
AD-629 548 FLD. 20/8

•NUCLEAR REACTIONS
NUCLEAR ENERGY
REPRINT: ENERGY ESTIMATION FOR HIGH-ENERGY NUCLEARINTERACTIONS.
AD-629 564 FLD. 20/8

•NUCLEAR SCATTERING
DIFFERENTIAL EQUATIONS
REPRINT: RICCATI EQUATION AND REGGE POLES.
AD-629 395 FLD. 12/1

ELEMENTARY PARTICLES
REPRINT: PROOF THAT SCATTERING IMPLIES PRODUCTION INQUANTUM FIELD THEORY.
AD-629 969 FLD. 20/8

•NUCLEAR SPINS
PRECESSION
TRANSLATION OF RUSSIAN PATENT: OSCILLATOR WITH FREQUENCYDETERMINED BY LARMOR PRECESSION FREQUENCY OF NUCLEARSPINS.
AD-629 071 FLD. 9/5

RELAXATION TIME
REPRINT: NUCLEAR SPIN RELAXATION IN PI-TYPE INSB ATLIQUID-HELIUM TEMPERATURES.
AD-629 578 FLD. 20/12

•NUCLEAR WARFARE
UNITED STATES
SURVEY OF WEAPONS AND HAZARDS WHICH MAY FACE THEUNITED STATES PEOPLE IN WARTIME.
AD-629 291 FLD. 15/3

•NUMBER THEORY
ALGEBRA
ZETA FUNCTION OF A HYPERSURFACE.
AD-629 477 FLD. 12/1

INTEGRAL TRANSFORMS
REPRINT: THEOREM ON THE ZEROS OF CAUSAL TRANSFORMS.
AD-629 557 FLD. 12/1

•NUMERICAL METHODS AND PROCEDURES
PARTIAL DIFFERENTIAL EQUATIONS
TRANSLATION OF RUSSIAN RESEARCH: DIFFERENTIAL METHODFOR THE NUMERICAL SOLUTION OF TWO DIMENSIONAL NONSTATIONARY NAVIER-STOKES EQUATIONS FOR A COMPRESSIBLEGAS.
AD-629 058 FLD. 20/4

•NUMERICAL METHODS + PROCEDURES
CONFORMAL MAPPING
TRANSLATION OF UKRAINIAN RESEARCH: A METHOD OF APPROXIMATE CONFORMAL MAPPING OF POLYGONAL REGIONS ONTO AUNIT CIRCLE.
AD-629 309 FLD. 12/1

•NYLON COATINGS
ADDITIVES
TRANSLATION OF RUSSIAN RESEARCH: STUDYING THE EFFECT OFADDITIONS TO POLYCAPROLACTAM 'B' ON ANTIFRICTIONPROPERTIES AND ADHESION TO METAL.
AD-629 286 FLD. 11/9

•N-BODY PROBLEM
ORBITAL TRAJECTORIES
PERIODIC TRAJECTORIES IN CISLUNAR SPACE VERY RESTRICTEDFOUR BODY APPROXIMATION.
AD-629 373 FLD. 3/3

QUANTUM MECHANICS
REPRINT: QUANTUM-MECHANICAL BOLTZMANN EQUATION.

AD-629 881 FLD. 20/10

•N-HETEROCYCLIC COMPOUNDS
CHEMICAL REACTIONS
REACTIONS OF 2- AND 4-PICOLINE N-OXIDES WITH PHENYLACETICANHYDRIDE.
AD-629 039 FLD. 7/3

FREE RADICALS
REPRINT: ION RADICALS. PHENOTHIAZINE, PHENOTHIAZINES-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS.
AD-629 593 FLD. 7/3

SYNTHESIS(CHEMISTRY)
PHOTOCHEMICAL SYNTHESIS OF POLYAZACYCLOBUTANE SYSTEMS.
AD-629 218 FLD. 7/3
REPRINT: SYNTHESIS OF A PHENANTHRIDENE FROM AN AROMATICSCHIFF BASE BY A PHOTOOXIDATIVE RING CLOSURE.
AD-629 637 FLD. 7/3

•OCEAN WAVES
BIBLIOGRAPHY
INTERNAL OCEAN WAVES BIBLIOGRAPHY.
AD-629 237 FLD. 8/10

•OCEANOLOGY
GEOCHEMISTRY
REPRINT: ISOTOPIC OCEANOGRAPHY: DEUTERIUM AND OXYGEN18 VARIATIONS IN THE OCEAN AND THE MARINE ATMOSPHERE.
AD-629 490 FLD. 8/10

INDIAN OCEAN
CRUISE PLANS FOR R/V CHAIN CRUISE NO. 43, INDIAN OCEANEXPEDITION.
AD-629 999 FLD. 8/10

•OILS
OXIDATION
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF OIL OXIDATIONON THE PROCESS OF RUNNING-IN A RING-SOCKET PAIR IN ANINTERNAL COMBUSTION ENGINE.
AD-629 910 FLD. 21/7

•OPERATORS(MATHEMATICS)
PARTIAL DIFFERENTIAL EQUATIONS
REPRINT: DISCRETE REPRESENTATIONS OF PARTIAL DIFFERENTIALOPERATORS.
AD-629 694 FLD. 12/1

•OPTICAL PROPERTIES
ALUMINUM
REPRINT: EVAPORATED DIELECTRIC FILM FOR DETERMINING THEOPTICAL CONSTANTS OF A METAL.
AD-629 999 FLD. 20/6

•OPTICS
QUANTUM MECHANICS
FUNDAMENTAL THEOREM IN QUANTUM OPTICS.
AD-629 947 FLD. 20/6

•ORBITAL TRAJECTORIES
ANALYSIS OF VARIANCE
ORBIT DETERMINATION AND ANALYSIS BY THE MINIMUMVARIANCE METHOD.
AD-629 493 FLD. 22/3

CELESTIAL MECHANICS
PERIODIC TRAJECTORIES IN CISLUNAR SPACE VERY RESTRICTEDFOUR BODY APPROXIMATION.
AD-629 373 FLD. 3/3

•ORGANIC COMPOUNDS
CRYSTAL STRUCTURE
BIBLIOGRAPHY OF RUSSIAN RESEARCH: STRUCTURE OF ORGANICCRYSTALS.
AD-629 079 FLD. 20/2

SEPARATION
REPRINT: CHARACTERISTICS OF POROUS CELLULOSE ACETATEMEMBRANES FOR THE SEPARATION OF SOME ORGANIC SUBSTANCESIN AQUEOUS SOLUTION.
AD-629 966 FLD. 7/4

•ORGANIC NITROGEN COMPOUNDS
OXIDATIONREDUCTION REACTIONS
DEOXYGENATION REACTIONS OF AMINE OXIDES AND SULFOXIDES.
AD-629 919 FLD. 7/3

PHOTOCHEMISTRY
REPRINT: PHOTYLYSIS OF GASEOUS ALKYL AZIDOFORMATESWITH THE FORMATION OF CARBALKOXYNITRENES.
AD-629 537 FLD. 8/1

•ORGANIC PHOSPHORUS COMPOUNDS
CHEMICAL PROPERTIES
REPRINT: THE SYNTHESIS AND REACTIONS OF DISDIPHENYLPHOSPHINIC PEROXIDE.
AD-629 690 FLD. 7/3

•ORGANIC PIGMENTS
BIOSYNTHESIS
REPRINT: BIOSYNTHESIS OF PULCHERRIMINIC ACID.
AD-629 960 FLD. 6/1

MOLECULAR STRUCTURE
REPRINT: STRUCTURE OF BOSTRYCOICIN, A BETA-AZAANTHRAQUINONE FROM FUSARIUM SOLANI D2 PURPLE.
AD-629 953 FLD. 7/3

•ORGANIC SOLVENTS
SEPARATION
REPRINT: CHARACTERISTICS OF POROUS CELLULOSE ACETATEMEMBRANES FOR THE SEPARATION OF SOME ORGANIC SUBSTANCESIN AQUEOUS SOLUTION.
AD-629 966 FLD. 7/4

•ORGANIC SULFUR COMPOUNDS
PHOTOLYSIS
REPRINT: THE PHOTOLYTIC DECOMPOSITION OF SOME SULFONES BYAN INTERNALLY SENSITIZED PATH.
AD-629 638 FLD. 7/3

•OSCILLATION
FLUID MECHANICS
HYDRAULIC ANALOG STUDY OF THE HARTMANN OSCILLATORPHENOMENON.
AD-629 089 FLD. 20/4

•OSCILLATORS
MASERS
REPRINT: THE EFFECTS OF OPTICAL PUMPING ON THE RB87MASER OSCILLATOR.
AD-629 929 FLD. 20/5

NUCLEAR SPINS
TRANSLATION OF RUSSIAN PATENT: OSCILLATOR WITH FREQUENCYDETERMINED BY LARMOR PRECESSION FREQUENCY OF NUCLEARSPINS.
AD-629 071 FLD. 9/5

•OSCILLOGRAPHS
DETONATION WAVES
TRANSLATION OF RUSSIAN RESEARCH: IMPROVEMENT OF METHODSFOR MEASURING DETONATION RATES.
AD-629 609 FLD. 14/2

•OXIDATION
DEHYDRATED FOODS
EFFECT OF EXPOSURE TO OXYGEN ON CHANGES IN MEATS ANDVEGETABLES DURING STORAGE.
AD-629 484 FLD. 6/8

LOW-TEMPERATURE RESEARCH
STUDIES OF LOW-TEMPERATURE OXIDATION REACTIONS.
AD-629 307 FLD. 7/2

REACTION KINETICS
REPRINT: KINETICS OF THE PHENOL-INHIBITED AUTOXIDATION OFTETRALIN.
AD-629 963 FLD. 7/4
REPRINT: ABSOLUTE RATE CONSTANTS FOR HYDROCARBONAUTOXIDATION. DEUTERO STYRENES AND RING-SUBSTITUTEDSTYRENES.
AD-629 964 FLD. 7/4

•OXIDATION-REDUCTION REACTIONS
ORGANIC COMPOUNDS
DEOXYGENATION REACTIONS OF AMINE OXIDES AND SULFOXIDES.
AD-629 919 FLD. 7/3

•OXIDES
SPECTRA(INFRARED)
REPRINT: INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARY ARSINE OXIDES.
AD-629 696 FLD. 7/4

•OXIDIZERS
CHEMICAL PROPERTIES
GENERATION OF THE FO RADICAL AND PRESSURE REACTIONS OFDIFLUORODIAZINE.
AD-629 928 FLD. 7/2

MOLECULAR STRUCTURE
DETERMINATION OF THE MOLECULAR STRUCTURE OF TRIOXYGENDIFLUORIDE.
AD-629 077 FLD. 7/2

•OXYGEN
CONVULSIVE DISORDERS
REPRINT: BRAIN LESIONS AND HYPERBARIC OXYGEN CONVULSIONS.
AD-629 927 FLD. 6/5

OCEANOGRAPHIC DATA
REPRINT: ISOTOPIC OCEANOGRAPHY: DEUTERIUM AND OXYGEN18 VARIATIONS IN THE OCEAN AND THE MARINE ATMOSPHERE.
AD-629 490 FLD. 8/10

•OXYGEN COMPOUNDS
FLUORIDES
GENERATION OF THE FO RADICAL AND PRESSURE REACTIONS OFDIFLUORODIAZINE.
AD-629 928 FLD. 7/2
DETERMINATION OF THE MOLECULAR STRUCTURE OF TRIOXYGENDIFLUORIDE.
AD-629 077 FLD. 7/2

•OZONE
TROPICAL CYCLONES
REPRINT: OZONE AND TEMPERATURE STRUCTURE IN A HURRICANE.
AD-629 123 FLD. 4/2

•O-HETEROCYCLIC COMPOUNDS
FREE RADICALS
REPRINT: ION RADICALS. PHENOXATHIIN AND PHENOXATHIIN9-OXIDE IN SULFURIC ACID.
AD-629 592 FLD. 7/3

•PARABOLIC ANTENNAS
ANTENNA FEEDS
REPRINT: LATERAL-FEED DISPLACEMENT IN A PARABOLOID.
AD-629 018 FLD. 9/1
SHAPED REFLECTOR AS A PRIMARY FEED FOR HAYSTACK.
AD-629 375 FLD. 9/5

MILLIMETER WAVES
AFCRL 29-FT MILLIMETER-WAVE ANTENNA.
AD-629 170 FLD. 9/5

•PARAMAGNETIC RESONANCE
IRON
REPRINT: PARAMAGNETIC RESONANCE OF TRIVALENT FE57 INDOUBLE NITRATE CRYSTALS.
AD-629 872 FLD. 7/4

•PARTICLE SIZE
COLLOIDS
DETERMINATION OF PARTICLE SIZE DISTRIBUTIONS INEMULSIONS BY LIGHT SCATTERING.
AD-629 940 FLD. 7/4

•PASTEURELLA
DISEASES
TRANSLATION OF RUSSIAN RESEARCH: NEW VARIETY OF PLAGUEMICROBE.
AD-629 630 FLD. 6/13

EPIDEMIOLOGY
TRANSLATION OF RUSSIAN RESEARCH: QUESTIONS IN THEEPIDEMIOLOGY AND PROPHYLAXIS OF TULAREMIA.
AD-629 632 FLD. 6/13

USSR
TRANSLATION OF RUSSIAN RESEARCH: NATURAL TULAREMIA FOCION THE TERRITORY OF THE UKRAINIAN SSR.
AD-629 647 FLD. 6/13

VACCINES
TRANSLATION OF RUSSIAN RESEARCH: STIMULATION OF TYPHOIDAGGLUTININS UNDER THE INFLUENCE OF THE EV PLAGUE VACCINE.
AD-629 608 FLD. 6/13
TRANSLATION OF RUSSIAN RESEARCH: BIOLOGICAL PROPERTIESOF THE NIIEG TULAREMIA VACCINE STRAINS.
AD-629 623 FLD. 6/13

•PATTERN RECOGNITION
LEARNING MACHINES
APPLICATION OF MICROELECTRONICS TO SYNTHETIC NERVENETWORKS.
AD-629 229 FLD. 6/4

•PELTIER EFFECT
COOLING + VENTILATION EQUIPMENT
TRANSLATION OF RUSSIAN RESEARCH: THERMOELECTRICCOOLING AND ITS PRACTICAL APPLICATION.
AD-629 292 FLD. 13/1

•PEPTIDE HYDROLASES
INHIBITION
BIOLOGICAL SIGNIFICANCE OF A PROTEASE INHIBITOR NEWLY ISOLATEDFROM ANIMAL TISSUES IN INFLAMMATION.
AD-629 889 FLD. 6/1

•PERCHLORATES
DECOMPOSITION
STUDY OF THE DECOMPOSITION MECHANISM OF AMMONIUMPERCHLORATE.
AD-629 191 FLD. 7/2

•PERFORMANCE TESTS
EFFECTIVENESS
CONCEPTS AND PRACTICES IN THE ASSESSMENT OF HUMANPERFORMANCE IN AIR FORCE SYSTEMS.
AD-629 041 FLD. 5/10

•PERIODICALS
SCIENTIFIC RESEARCH
SCIENTIFIC JOURNALS: AVAILABILITY OF RESEARCH SPONSOREDBY OFFICE OF AEROSPACE RESEARCH.
AD-629 909 FLD. 5/2

•PERSONALITY
ANALYSIS
CHANGES IN THE JUDGMENTS OF SENSITIZERS AND REPRESSERS INRESPONSE TO FAILURE AND SUCCESS EVALUATIONS OF GROUPPERFORMANCE.
AD-629 022 FLD. 5/10

BARGAINING
PERSONALITY/ATTITUDE SCHEDULE FOR USE IN EXPERIMENTALBARGAINING STUDIES.
AD-629 992 FLD. 5/10

PERCEPTION(PSYCHOLOGY)
COGNITIVE DETERMINANT OF IMPRESSION FORMATION.
AD-629 019 FLD. 5/10

•PERSONNEL MANAGEMENT
DECISION MAKING
COMPUTER SIMULATION OF ROLE CONFLICT RESOLUTION.
AD-629 991 FLD. 5/9

DECISION THEORY
DECISION THEORY AS APPLIED TO PERSONNEL CLASSIFICATION ANDEVALUATION.
AD-629 009 FLD. 5/9

OPTIMIZATION
OPTIMAL ALLOCATION OF ENLISTED MEN: FULL REGRESSIONEQUATIONS VS. APTITUDE AREA SCORES.
AD-629 229 FLD. 5/9

•PERTURBATION THEORY
ATOMIC ENERGY LEVELS
PERTURBATION THEORY: LOWER BOUNDS TO ENERGY EIGENVALUES,GROUND STATE AND EXCITED STATES.
AD-629 369 FLD. 20/10

FLUID MECHANICS
APPROXIMATE SOLUTION OF THE CROCCO EQUATION.
AD-629 206 FLD. 12/1

S-MATRIX
REPRINT: PHOTONS AND GRAVITONS IN PERTURBATION THEORY:DERIVATION OF MAXWELL'S AND EINSTEIN'S EQUATIONS.
AD-629 962 FLD. 20/10

•PETROLOGY
METEORITES
REPRINT: SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARYCHONDRITES.
AD-629 169 FLD. 8/7

ULTRAVIOLET SPECTROSCOPY
RESPONSE OF SELECTED ROCK SPECIMENS TO VACUUM ULTRAVIOLET LIGHT.
AD-629 393 FLD. 8/7

•PHAGOCYTES
TISSUE CULTURE
TRANSLATION OF RUSSIAN RESEARCH: MACROPHAGE CULTURESPREPARED IN VITRO AND A MORPHOLOGICAL STUDY OFTHEIR CELLULAR ELEMENTS.
AD-629 642 FLD. 6/13

•PHASE SHIFT
CALCULUS OF VARIATIONS
REPRINT: TAMM VARIATIONAL PRINCIPLE AND ITS GENERALIZATIONTO THE SCATTERING AMPLITUDE.
AD-629 278 FLD. 20/10

•PHASE SHIFTERS
FERRITES
RECIPROCAL TEN FERRITE PHASE SHIFTERS.
AD-629 209 FLD. 9/5

•PHASE STUDIES
EUROPIUM COMPOUNDS
REPRINT: THE EFFECT OF PRESSURE ON THE FERROMAGNETICPHASE TRANSITION OF EUO.
AD-629 109 FLD. 20/12

LABORATORY EQUIPMENT
REPRINT: SOME CHEMICAL APPLICATIONS OF THERMODILATOMETRICANALYSIS.
AD-629 989 FLD. 7/4

THERMODYNAMICS
THERMODYNAMICS OF THE LIQUID-LIQUID CRITICAL MIXINGREGION.
AD-629 459 FLD. 20/13

TRANSITION ELEMENTS
TERNARY INTERSTITIAL COMPOUNDS OF BORON AND NITROGEN WITHTRANSITION AND POST-TRANSITION METALS.
AD-629 028 FLD. 11/6

•PHENANTHRENES
RESISTANCE(ELECTRICAL)
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIESIN ORGANIC AND INORGANIC MATERIALS.
AD-629 889 FLD. 20/12

•PHENOLS
CHEMICAL REACTIONS
TRANSLATION OF RUSSIAN RESEARCH: REACTIONS OF CHLOROMETHYLSILANES AND SILOXANE WITH DEHYDRIC PHENOLS.
AD-629 613 FLD. 11/9

OXIDATION
OXIDATIVE STUDIES OF POLYPHENOLS.
AD-629 879 FLD. 7/3

•PHENOTHIAZINES
FREE RADICALS
REPRINT: ION RADICALS. PHENOTHIAZINE, PHENOTHIAZINES-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS.
AD-629 993 FLD. 7/3

•PHOSPHATES
INORGANIC POLYMERS
VISCOELASTIC RELAXATION MECHANISM OF INORGANIC POLYMERS:SIMULTANEOUS MULTIPLE MECHANISM IN LANTHANUM-DOPEDSODIUM POLYPHOSPHATE AND IN ARSENIC-DOPED SULFUR POLYMER.
AD-629 329 FLD. 11/9
GLASS TRANSITION IN IONIC PHOSPHATE POLYMERS.
AD-629 330 FLD. 11/9
VISCOELASTIC RELAXATION MECHANISMS OF INORGANICPOLYMERS: COUNTERION EFFECTS IN BULK PHOSPHATEPOLYELECTROLYTES.
AD-629 331 FLD. 11/9

TEETH
REPRINT: DEFINITION AND OBJECTIVES OF THE CONFERENCEON PHOSPHATES AND DENTAL CARIES.
AD-629 926 FLD. 6/5

•PHOSPHORYLATION
CHLOROPLASTS
REPRINT: LIGHT EFFECTS ON OXYGEN EVOLUTION AND PHOSPHORYLATION IN SPINACH CHLOROPLASTS.
AD-629 097 FLD. 6/3

•PHOTOCHEMISTRY
UPPER ATMOSPHERE
PHOTOCHEMICAL DESTABILIZATION OF GRAVITY WAVES NEAR THEMESOPAUSE.
AD-629 011 FLD. 4/1

•PHOTOELECTRIC CELLS(SEMICONDUCTOR)
GERMANIUM
STUDY OF GERMANIUM DEVICES FOR USE IN A THERMOPHOTOVOLTAIC CONVERTER.
AD-629 868 FLD. 9/1

•PHOTOELECTRIC EFFECT
GAS IONIZATION

PHOTOIONIZATION IN GASES.
AD-629 312 FLD. 20/3

•PHOTOGRAMMETRY
SPACE PERCEPTION
INVESTIGATION OF FUSION AND FIXATION DISPARITY LIMITS FORPHOTOGRAMMETRY.
AD-629 217 FLD. 5/10

•PHOTOGRAPHIC RECONNAISSANCE
MATHEMATICAL MODELS
MATHEMATICAL MODEL OF PHOTOGRAPHIC RECONNAISSANCE.
AD-629 319 FLD. 17/7

•PHOTOGRAPHY
INFORMATION RETRIEVAL
PHOTOGRAPHY IN INFORMATION STORAGE AND RETRIEVAL:1965 SYMPOSIUM.
AD-629 029 FLD. 5/2

•PHOTOLYSIS
NITROGEN COMPOUNDS
REPRINT: EXCITED OXYGEN ATOMS IN THE PHOTOLYSIS OFN2O AND NO2.
AD-629 971 FLD. 8/1

•PHOTOMULTIPLIERS
FEEDBACK AMPTIFIERS
REPRINT: PERIODICALLY ADJUSTED FEEDBACK CONTROLSMULTIPLIER PHOTOTUBE.
AD-629 959 FLD. 9/5

RADIATION DAMAGE
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF CO60 GAMMARAYS ON PHOTOMULTIPLIER PARAMETERS.
AD-629 197 FLD. 9/1

•PHOTONS
FIELD THEORY
REPRINT: PHOTONS AND GRAVITONS IN PERTURBATION THEORY:DERIVATION OF MAXWELL'S AND EINSTEIN'S EQUATIONS.
AD-629 962 FLD. 20/10

•PHOTOSYNTHESIS
BIBLIOGRAPHIES
LIFE SUPPORT SYSTEMS, PHOTOSYNTHESIS: ANALYTICALSURVEY.
AD-629 269 FLD. 6/11

OXYGEN
REPRINT: LIGHT EFFECTS ON OXYGEN EVOLUTION AND PHOSPHORYLATION IN SPINACH CHLOROPLASTS.
AD-629 097 FLD. 6/3
PHOTOSYNTHETIC MECHANISMS UNDER SUB-OPTIMAL CONDITIONS:OXYGEN PARTIAL PRESSURE AND GLYCOLLIC ACID PRODUCTION INCHLORELLA.
AD-629 495 FLD. 6/1

•PHOTOTUBES
LIGHT COMMUNICATION SYSTEMS
MICROWAVE OPTICAL RECEIVER TECHNIQUES.
AD-629 382 FLD. 17/2

•PIPES
ACOUSTICS
HYDRAULIC ANALOGY OF AN ACOUSTIC WAVE IN A PIPE.
AD-629 088 FLD. 20/14

ANODIC COATINGS
DEVELOPMENT OF A FIXTURE AND A PROCEDURE FOR HARDANODIZING THE SURFACES OF A LONG ALUMINUM TUBE WITH ADEEP BLIND-HOLE.
AD-629 993 FLD. 11/3

COMPRESSIBLE FLOW
TRANSLATION OF RUSSIAN RESEARCH: FORCED OSCILLATIONS OF ASTREAM OF AN IDEAL COMPRESSIBLE LIQUID IN A HOMOGENEOUSSTRAIGHT PIPE.
AD-629 060 FLD. 20/9

FLUID DYNAMIC PROPERTIES
TRANSLATION OF RUSSIAN RESEARCH: OSCILLATIONS AND STABILITYOF A TRIPLE LAYER CYLINDRICAL SHELL WITH INCOMPRESSIBLEIDEAL LIQUID.
AD-629 297 FLD. 20/11

FLUID FLOW
TURBULENT FLOW IN ROUGH PIPES.
AD-629 037 FLD. 20/9

NON-DESTRUCTIVE TESTING
TRANSLATION OF RUSSIAN RESEARCH: ULTRASONICDEFECTOSCOPY OF TUBES.
AD-629 229 FLD. 13/8

•PLAN POSITION INDICATORS
MAPPING
RADAR AND GEOLOGY.
AD-629 887 FLD. 8/2

•PLANETARY ATMOSPHERES
OPTICAL PHENOMENA
SCATTERING OF SUNLIGHT INTO PLANETARY SHADOW CONES.
AD-629 260 FLD. 4/1

•PLANING SURFACES
VIBRATION
INVESTIGATION OF SELF-EXCITED PLANING VIBRATION ATLARGE WETTED ASPECT RATIO.
AD-629 339 FLD. 13/10

•PLANTS(BOTANY)
PARASITES
TRANSLATION OF RUSSIAN RESEARCH: STRIGA LUTEA.
AD-629 629 FLD. 6/3

RADIATION EFFECTS
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF IONIZINGRADIATION ON ANIMALS AND PLANTS.
AD-629 939 FLD. 6/18

SYMPOSIA
TRANSLATION OF RUSSIAN RESEARCH: SEMINAR ON NEW ENSILAGEFORAGE PLANTS.
AD-629 691 FLD. 6/3

•PLASMA JETS
SYNTHESIS(CHEMISTRY)
PLASMA JETS FOR CHEMICAL SYNTHESIS.
AD-629 991 FLD. 20/9

TEMPERATURE
INVESTIGATION OF THE PROPERTIES OF HOT PLASMA GASES ANDMEASUREMENT OF GAS TEMPERATURES NEAR SOLID SURFACES.
AD-629 049 FLD. 20/9

•PLASMA MEDIUM
COLLECTING METHODS
TRANSLATION OF A RUSSIAN PATENT: METHOD OF RETAINING ANDACCUMULATING HIGH TEMPERATURE PLASMA IN A TRAP.
AD-629 070 FLD. 20/9

DIFFUSION
REPRINT: DIFFUSION AND CONDUCTIVITY OF PLASMAS IN STRONGEXTERNAL FIELDS.
AD-629 998 FLD. 20/9

ELECTROMAGNETIC WAVES
WAVE NATURE OF MOVING STRIATIONS.
AD-629 189 FLD. 20/9

FLUID MECHANICS
PLASMA FLUID MECHANICS AND RAREFIED GAS FLOWSI FINALSUMMARY REPT.
AD-629 580 FLD. 20/9

SOUND TRANSMISSION
REPRINT: LONGITUDINAL WAVES IN A WEAKLY IONIZED GASISOUND PROPAGATION.
AD-629 879 FLD. 20/9

SPECTROSCOPY
NEW METHODS OF PLASMA DIAGNOSTICS ACCORDING TOSPECTROSCOPIC DATA: TRANSLATION OF RUSSIAN DOCUMENT.
AD-629 239 FLD. 20/9

THERMAL DIFFUSION
ELECTRON THERMAL DIFFUSIVITY IN RARE-GAS AFTERGLOWPLASMAS.
AD-629 082 FLD. 20/9

WAVE TRANSMISSION
REPRINT: ON TRANSIENT WAVE PROPAGATION IN A PLASMA.
AD-629 133 FLD. 20/14

•PLASMA OSCILLATIONS
NONLINEAR SYSTEMS
NONLINEAR MECHANICS OF UNIVERSAL PLASMA INSTABILITIES.
AD-629 033 FLD. 20/9

•PLASMA PHYSICS
CESIUM
BASIC PLASMA PROCESSES. BEHAVIOR OF ALKALI METAL VAPORPLASMAS.
AD-629 927 FLD. 20/9

SCIENTIFIC RESEARCH
ABSTRACTS OF RESEARCH PAPERS CONCERNED WITH IONOSPHERICPROPAGATION, PLASMA PHYSICS, CYCLOTRON RESONANCE, ANDWHISTLERS.
AD-629 903 FLD. 4/1
PLASMA RESEARCH.
AD-629 929 FLD. 20/9
CONSOLIDATED SEMIANNUAL PROGRESS REPORT NO. 2, 1 APRIL1969 THROUGH 30 SEPTEMBER 1969, BY ELECTRONICS SCIENCESLABORATORY, UNIVERSITY OF SOUTHERN CALIFORNIA.
AD-629 971 FLD. 20/12

SOLAR SYSTEMS
REPRINT: SOLAR SYSTEM MAGNETIC FIELDS AND PLASMAS.
AD-629 178 FLD. 3/2

STABILITY
NONLINEAR MECHANICS OF UNIVERSAL PLASMA INSTABILITIES.
AD-629 033 FLD. 20/9

THEORY
THEORETICAL PROBLEMS IN PLASMA PHYSICS.
AD-629 929 FLD. 20/9

•PLASTIC LAMINATES
SUBMARINE HULLS
PROTECTIVE COATINGS FOR DEEP SUBMERGENCE VESSELS.
AD-629 896 FLD. 11/3

•PLASTICS
ELECTRICAL PROPERTIES
ELECTRICAL PROPERTIES OF PLASTIC MATERIALS: DATA COMPILEDFROM TECHNICAL CONFERENCE SEARCH.
AD-629 922 FLD. 11/9

MARINE ENGINEERING
TRANSLATION OF RUSSIAN RESEARCH: PLASTIC MARINE FITTINGS.
AD-629 619 FLD. 13/10

•PNEUMATIC DEVICES
INPUT-OUTPUT DEVICES
TRANSLATION OF A RUSSIAN PATENT: PNEUMATIC CONVERTER.
AD-629 906 FLD. 13/7

•PNEUMATIC SYSTEMS
POWER
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-629 889 FLD. 13/7

•POLAROGRAPHIC ANALYSIS
ACROLEINS
TRANSLATION OF RUSSIAN RESEARCH: POLAROGRAPHICDETERMINATION OF ACROLEIN IN THE OXIDATION PRODUCTS OFPROPYLENE ON COPPER CATALYSTS.
AD-629 097 FLD. 7/3

•POLYAMIDE PLASTICS
BONDING
TRANSLATION OF RUSSIAN PATENT: METHOD OF BONDINGPOLYAMIDES TO METALS.
AD-629 228 FLD. 13/8

FRICTION
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF FRICTION OFPOLYAMIDES ON STEEL.
AD-629 309 FLD. 11/9

•POLYATOMIC MOLECULES
MOLECULAR ENERGY LEVELS
REPRINT: MANY-SHOT EXPANSION TECHNIQUE FOR ANALYZINGRELAXATION PROCESSES IN A MULTILEVEL SYSTEM.
AD-629 602 FLD. 7/4

SPECTRA(INFRARED)
INFRARED SPECTRA OF POLYATOMIC HIGH-TEMPERATUREMOLECULES: LITHIUM FLUORIDE AND LITHIUM CHLORIDE VAPORIZATION SPECIES.
AD-629 045 FLD. 7/2

•POLYCLCLIC COMPOUNDS
SYNTHESIS(CHEMISTRY)
PHOTOCHEMICAL SYNTHESIS OF POLYAZACYCLOBUTANE SYSTEMS.
AD-629 218 FLD. 7/3

•POLYCYCLIC COMPOUNDS
FREE RADICALS
REPRINT: SUBSTITUTED PERINAPHTHENYL ANION RADICALS.
AD-629 121 FLD. 7/3

OXIDATION
REPRINT: KINETICS OF THE PHENOL-INHIBITED AUTOXIDATION OFTETRALIN.
AD-629 963 FLD. 7/4

SYNTHESIS(CHEMISTRY)
REPRINT: 2,3-NAPHTHOQUINONOID HETEROCYCLES. II. A HIGHLYSTABILIZED THIADIAZOLE ANALOG OF ANTHRACENE.
AD-629 636 FLD. 7/3
REPRINT: SYNTHESIS OF A PHENANTHRIDENE FROM AN AROMATICSCHIFF BASE BY A PHOTOOXIDATIVE RING CLOSURE.
AD-629 637 FLD. 7/3

•POLYETHYLENE PLASTICS
HEAT OF FUSION
REPRINT: CALORIMETRIC STUDY OF THE FUSION OF MOLECULARWEIGHT FRACTIONS OF LINEAR POLYETHYLENE.
AD-629 177 FLD. 7/3

MELTING
REPRINT: X-RAY DIFFRACTION STUDIES OF THE MELTING OFLINEAR POLYETHYLENE.
AD-629 176 FLD. 7/3

ZONE MELTING
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIESIN ORGANIC AND INORGANIC MATERIALS.
AD-629 884 FLD. 20/12

•POLYMERS
MOLECULAR STRUCTURE
REPRINT: SEMIQUANTITATIVE ASPECT OF SHORT BRANCHDETECTION BY USING POLYELECTROLYTE EXPANSIVE EFFECTS.
AD-629 929 FLD. 7/4

•POLYNOMIALS
FUNCTIONAL ANALYSIS
REPRINT: PIECEWISE POLYNOMIAL INTERPOLATION ANDAPPROXIMATION.
AD-629 863 FLD. 12/1
CONCERNING THE ROOTS OF A POLYNOMIAL WHICH CONTAIN APERTURBATION PARAMETER.
AD-629 912 FLD. 12/1

•POLYSACCHARIDES
COPOLYMERIZATION
REPRINT: POLYSACCHARIDE GRAFT COPOLYMER PREPARED BYANIONIC COUPLING.
AD-629 179 FLD. 11/9

•POSITION FINDING
RADIO NAVIGATION
TRANSLATION OF RUSSIAN TECHNICAL INFORMATION: SECTORRADIO-RANGE BEACONS WITH RADIATING EQUISIGNAL ZONES.
AD-629 916 FLD. 17/7

•POSTURE
VISUAL PERCEPTION
VISUAL LOCALIZATION OF THE HORIZONTAL AS A FUNCTION OF BODYTILT UP TO 90 DEGREES FROM GRAVITATIONAL VERTICAL.
AD-629 266 FLD. 6/19

•POTENTIAL THEORY
MECHANICAL WAVES
HARMONIC WAVE PROPAGATION IN ELASTIC RODS OF ELLIPTICALCROSS-SECTION.
AD-629 908 FLD. 20/11

•POWDERS
COMBUSTION
TRANSLATION OF RUSSIAN RESEARCH: TOWARD A THEORY OFSTABILITY OF POWDER COMBUSTION.
AD-629 059 FLD. 21/2

•POWER AMPLIFIERS
DIODES(SEMICONDUCTOR)
HIGH SPEED POWER AMPLIFIER USING AN ELECTRON SWITCHEDP-N JUNCTION.
AD-629 920 FLD. 9/5

•PRESSURE GAGES
SUPERSONIC FLOW
TRANSLATION OF A RUSSIAN PATENT: TOTAL PRESSURE PROBEFOR A SUPERSONIC GAS FLOW WITH A SLIGHTLY NONUNIFORMVELOCITY FIELD.
AD-629 064 FLD. 14/2

•PRINTED CIRCUITS
INTERMETALLIC COMPOUNDS
MICROELECTRONIC SOLID-STATE DISPLAY ASSEMBLY.
AD-629 370 FLD. 9/5

•PROBES
FIBER OPTICS
NEW APPROACH TO STUDIES OF MUCUS FLOW AND CILIARYACTIVITY.
AD-629 916 FLD. 6/12

METEOROLOGICAL INSTRUMENTS
MEASUREMENT OF WIND SHEAR.
AD-629 339 FLD. 4/2

•PROBLEM SOLVING
ANALYSIS
CONFLICT AND ITS RESOLUTION.
AD-629 918 FLD. 5/10

•PROGRAMMING LANGUAGES
COMMERCE
THEORY, PRACTICE, AND TREND IN BUSINESS PROGRAMMING.
AD-629 003 FLD. 9/2

SYNTAX
ANALYSIS OF SYNTAX BY A PRODUCTION COMPUTER LANGUAGE.
AD-629 963 FLD. 9/2

THEORY
DETERMINISTIC CONTEXT-FREE LANGUAGES.
AD-629 938 FLD. 9/2
ALGORITHMIC (PROGRAMMING) LANGUAGES PROJECT: FINALREPORT.
AD-629 990 FLD. 9/2

•PROGRAMMING(COMPUTERS)
ALGORITHMS
METHOD FOR SEEKING DATA AND ITS APPLICATION BY COMPUTER,TO THE ALGORITHM OF CRITICAL PATH DETERMINATION:TRANSLATION OF RUSSIAN PAPER.
AD-629 156 FLD. 9/2

COMMERCE
THEORY, PRACTICE, AND TREND IN BUSINESS PROGRAMMING.
AD-629 003 FLD. 9/2

CORRECTIONS
PROGRAMMING SYSTEM CL-I EXTENDED (CLIX).
AD-629 383 FLD. 9/2

HYPERONS
FORTRAN PROGRAMME FOR THE ANALYSISOF HYPERFRAGMENTSAND FOR OTHER EMULSION STUDIES.
AD-629 019 FLD. 18/8

MATRIX ALGEBRA
COMPUTATIONAL PROCEDURES FOR SENSITIVITY COEFFICIENTS INTIME-INVARIANT MULTIVARIABLE SYSTEMS.
AD-629 010 FLD. 12/1

MONTE CARLO METHOD
DESCRIPTION OF MONTE CARLO CODES FOR STUDYING LIGHTTRANSPORT IN THE ATMOSPHERE.
AD-629 119 FLD. 20/6
MONTE CARLO CODES FOR STUDY OF LIGHT TRANSPORT IN THEATMOSPHERE. VOLUME II: UTILIZATION INSTRUCTIONS.
AD-629 116 FLD. 20/6

OPTIMIZATION
MONOTONE CONGRUENCE ALGORITHMS.
AD-629 046 FLD. 9/2

•PROPELLANTS
COMBUSTION PRODUCTS
THERMODYNAMIC PROPERTIES OF PROPELLANT COMBUSTIONPRODUCTS.
AD-629 044 FLD. 21/2

•PROPELLERS(MARINE)
REVIEWS
TRANSLATION OF RUSSIAN RESEARCH: FROM OARS TO THEWATER-JET.
AD-629 510 FLD. 13/10

VIBRATION
SHIP HULL VIBRATIONS: A GUIDE FOR DESIGN STAGE CALCULATIONSOF PROPELLER EXCITED VIBRATIONS.
AD-629 389 FLD. 13/10

•PROPENES
OXIDATION
TRANSLATION OF RUSSIAN RESEARCH: POLAROGRAPHICDETERMINATION OF ACROLEIN IN THE OXIDATION PRODUCTS OFPROPYLENE ON COPPER CATALYSTS.
AD-629 097 FLD. 7/3

•PROSTHETICS
MEDICAL RESEARCH
UPPER EXTREMITY PROSTHETICS

RESEARCH. HUMAN TRACKING.SENSORY MOTOR CONTROL. MYOELECTRIC CONTROL.
AD-629 990 FLD. 6/5

NERVES
TRANSLATION OF RUSSIAN ARTICLE: PROSTHESIS OF NERVES.
AD-629 291 FLD. 6/5

•PROTECTIVE CLOTHING
SPACE ENVIRONMENT CONDITIONS
STUDY AND DEVELOPMENT OF MATERIALS AND TECHNIQUES FORPASSIVE THERMAL CONTROL OF FLEXIBLE EXTRAVEHICULAR SPACEGARMENTS.
AD-629 886 FLD. 6/11

•PROTON BOMBARDMENT
SOLAR CELLS
SILICON SOLAR CELLS: RADIATION DAMAGE, FROM 9.6-MEVPROTON BOMBARDMENT.
AD-629 990 FLD. 10/2

•PSYCHOLOGY
EXPERIMENTAL DATA
REPRINT: THE PLACE OF SUBJECTIVE EXPERIENCE IN CONTEMPORARYPSYCHOLOGY.
AD-629 109 FLD. 5/10

•PSYCHOMETRICS
BARGAINING
PERSONALITY/ATTITUDE SCHEDULE FOR USE IN EXPERIMENTALBARGAINING STUDIES.
AD-629 992 FLD. 5/10

COMPUTERS
SIMULATION MODELS FOR PSYCHOMETRIC THEORIES.
AD-629 979 FLD. 5/10

MATHEMATICAL MODELS
MODEL FOR THE GENERALIZABILITY OF TESTS CONSTRUCTED BYSTRATIFIED SAMPLING.
AD-629 901 FLD. 5/10

NAVAL PERSONNEL
VALIDITY OF THE ADVANCED TECHNICANS TEST IN PREDICTINGPERFORMANCE AT CLASS 'B' AND 'C' SCHOOLS.
AD-629 119 FLD. 5/9

•PUMPING(OPTICAL)
LASERS
LASER-PUMPED LASER.
AD-629 338 FLD. 20/5

MASERS
REPRINT: THE EFFECTS OF OPTICAL PUMPING ON THE RB87MASER OSCILLATOR.
AD-629 928 FLD. 20/5

•PUMPS
INSTALLATION
TRANSLATION OF RUSSIAN RESEARCH: MOUNTING DEVICE FORCAISSON PUMPS.
AD-629 191 FLD. 13/11

UNDERWATER EQUIPMENT
ICE CONSTRUCTION-PROTOTYPE SUBMERSIBLE ELECTRIC PUMPAND EXTENSION TUBE.
AD-629 920 FLD. 13/11

•PYRIDINES
CHEMICAL REACTIONS
REACTIONS OF 2- AND 4-PICOLINE N-OXIDES WITH PHENYLACETICANHYDRIDE.
AD-629 035 FLD. 7/3

•QUANTITATIVE ANALYSIS
ALUMINUM COMPOUNDS
DETERMINATION OF THE ALUMINA CONTENT OF ALUMINUM ALLOYS.
AD-629 257 FLD. 11/6

•QUANTUM MECHANICS
BOSONS
REPRINT: QUANTUM MECHANICS OF A MANY-BOSON SYSTEM ANDTHE REPRESENTATION OF CANONICAL VARIABLES.
AD-629 571 FLD. 20/10

CHEMICAL REACTIONS
THEORY OF INTERNAL RELAXATION IN CHEMICAL KINETICS.
AD-629 377 FLD. 7/4

OPTICS
FUNDAMENTAL THEOREM IN QUANTUM OPTICS.
AD-629 947 FLD. 20/6

TRANSPORT PROPERTIES
REPRINT: QUANTUM-MECHANICAL BOLTZMANN EQUATION.
AD-629 881 FLD. 20/10

•QUARTZ
COLOR CENTERS
CONCENTRATION DEPENDENCE OF SPIN-LATTICE RELAXATION TIMEOF COLOR CENTERS IN QUARTZ.
AD-629 098 FLD. 20/2

•QUEUEING THEORY
COMPUTERS
QUEUEING MODELS FOR FILE MEMORY OPERATION.
AD-629 943 FLD. 9/2

•QUINONES
OXIDATION
OXIDATIVE STUDIES OF POLYPHENOLS.
AD-629 879 FLD. 7/3

POLYMERIZATION
SYNTHESIS OF AMINOQUINONE POLYMERS FOR USE AS HEATRESISTANT ELASTOMERS.
AD-629 891 FLD. 11/10

•RABBITS
ACCLIMATIZATION
SEASONAL ACCLIMATION IN VARYING HARE (LEPUS AMERICANUS).
AD-629 956 FLD. 6/3

•RADAR ECHO AREAS
BIRDS
REPRINT: ON MEASURING THE RADAR CROSS SECTIONS OF DUCKSAND CHICKENS.
AD-629 163 FLD. 17/9

SCIENTIFIC RESEARCH
REPRINT: A LOOK INTO THE FUTURE OF RADAR SCATTERINGRESEARCH AND DEVELOPMENT.
AD-629 164 FLD. 17/9

•RADAR TRACKING
RADAR ECHO AREAS
REPRINT: A LOOK INTO THE FUTURE OF RADAR SCATTERINGRESEARCH AND DEVELOPMENT.
AD-629 164 FLD. 17/9

•RADIATION DAMAGE
CAPACITORS
TRANSLATION OF RUSSIAN RESEARCH: ABOUT RADIATION INJURIESTO RADIO COMPONENTS IN A SHARP GAMMA-RADIATION FIELD.
AD-629 039 FLD. 18/8

FERROELECTRIC MATERIALS
FERROELECTRICS: THEIR ELECTRICAL BEHAVIOR DURING, ANDSUBSEQUENT TO, IONIZING RADIATIONS.
AD-629 091 FLD. 9/1

GAMMA RAYS
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF CO60 GAMMARAYS ON PHOTOMULTIPLIER PARAMETERS.
AD-629 197 FLD. 9/1

NIOBIUM
POINT DEFECTS AND MECHANICAL PROPERTIES OF COLUMBIUM.
AD-629 975 FLD. 11/6

SEMICONDUCTOR DEVICES
SEMICONDUCTOR RADIATION RESPONSE PREDICTION: GENERALIZEDMODEL.
AD-629 391 FLD. 18/8

SOLAR CELLS
SILICON SOLAR CELLS: RADIATION DAMAGE, FROM 9.6-MEVPROTON BOMBARDMENT.
AD-629 990 FLD. 10/2

•RADIATION EFFECTS
CLOSTRIDIUM BOTULINUM
DETERMINATION OF EQUIVALENCE BETWEEN RADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CUREDMEATS.
AD-629 252 FLD. 6/8

IMMUNITY
REPRINT: RADIOSENSITIVITY OF THE IMMUNE RESPONSE TOSHEEP RED CELLS IN THE MOUSE, AS MEASURED BY THE HEMOLYTIC PLAQUE METHOD.
AD-629 502 FLD. 6/18

PLANTS(BOTONY)
STUDY OF THE RADIATION-INDUCED SOFTENING OF PLANT TISSUES.
AD-629 983 FLD. 6/8

•RADIATION SICKNESS
CANCER
SEQUENCE OF EVENTS IN RADIATION CARCINOGENESIS.
AD-629 917 FLD. 6/18

•RADIO ASTRONOMY
SOLAR ECLIPSES
REPRINT: COSMIC NOISE AND MAGNETIC MEASUREMENTSAT CALGARY DURING THE SOLAR ECLIPSE OF JULY 20, 1963.
AD-629 108 FLD. 3/2

SOLAR RADIATION
REPRINT: 2,700 MC./S. SOLAR PATROL AT THE DOMINION RADIOASTROPHYSICAL OBSERVATORY, PENTICTON, B. C.
AD-629 958 FLD. 3/2

SUN
REPRINT: HIGH-RESOLUTION OBSERVATIONS OF THE RADIO SUN AT9.1 CENTIMETERS ON JULY 20, 1963.
AD-629 366 FLD. 3/2

•RADIO NAVIGATION
NAVIGATION CHARTS
OMEGA NAVIGATIONAL SYSTEM CONDUCTIVITY MAP.
AD-629 990 FLD. 17/7

SHIPS
TRANSLATION OF RUSSIAN TECHNICAL INFORMATION: SECTORRADIO-RANGE BEACONS WITH RADIATING EQUISIGNAL ZONES.
AD-629 916 FLD. 17/7

•RADIO TRANSMISSION
TACTICAL WARFARE
ASSIGNMENT OF FREQUENCIES IN THE TACTICAL COMBATENVIRONMENT.
AD-629 989 FLD. 17/2.1

•RADIO WAVES
ABSORPTION
REPRINT: ELECTROMECHANICAL VERSION OF THE IGY RIOMETER.
AD-629 083 FLD. 14/2

PROPAGATION
A STUDY OF HIGH-FREQUENCY DIRECTIONAL PROPAGATION OVER A4SO KILOMETER EAST-TO-WEST PATH. PART I. DESCRIPTION OFTHE DIRECTIONAL PROPAGATION EXPERIMENT (THE COLUMBUSEXPERIMENT). PART II. AN ATLAS OF REDUCED DATA.
AD-625 913 FLD. 17/3

SCINTILLATION
EXPERIMENTAL INVESTIGATION OF THE COHERENCE DISTANCE OFTHE ATMOSPHERE FOR MICROWAVES.
AD-624 991 FLD. 20/14

•RADIOACTIVE ISOTOPES
SHIELDING
PHYSICS AND SHIELDING OF HETEROGENEOUS ISOTOPIC NEUTRONSOURCES.
AD-625 406 FLD. 18/2
VARIABLE INTENSITY ISOTOPIC SOURCES.
AD-625 915 FLD. 18/2

•RADIOACTIVITY
ANTARCTIC REGIONS
ATMOSPHERIC RADIOACTIVITY IN ANTARCTICA 1956-1963.
AD-625 939 FLD. 4/1

•RADIOBIOLOGY
ABSTRACTS
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF IONIZINGRADIATION ON ANIMALS AND PLANTS.
AD-624 934 FLD. 6/18

•RADIOFREQUENCY
MATHEMATICAL MODELS
ASSIGNMENT OF FREQUENCIES IN THE TACTICAL COMBATENVIRONMENT.
AD-625 585 FLD. 17/2.1

•RADIOFREQUENCY GENERATORS
K BAND
TUNABLE SOLID STATE K-BAND GENERATOR.
AD-625 310 FLD. 9/5

•RADIOMETERS
INFRARED EQUIPMENT
REPRINT: APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY.
AD-624 948 FLD. 4/2

SATELLITES(ARTIFICIAL)
DUAL-CHANNEL SATELLITE RADIOMETER TO MAKE INFRAREDMEASUREMENTS.
AD-625 380 FLD. 17/5

•RADIOSONDES
TRACKING
PERFORMANCE OF THE AN/GMD-2 RAWIN SET IN THE DENPROSYSTEM.
AD-625 118 FLD. 14/2

•RARE EARTH ELEMENTS
MARINE GEOLOGY
RARE EARTH DISTRIBUTIONS IN THE MARINE ENVIRONMENT.
AD-625 347 FLD. 8/3

•REACTION KINETICS
EXPLOSIONS
TRANSLATION OF RUSSIAN RESEARCH: THE TRANSIENT THEORY OFTHERMAL SELF-IGNITION.
AD-625 151 FLD. 21/2

•READING
CHILDREN
REPRINT: SPATIAL ORGANIZATION OF CHILDREN'S RESPONSESTO A PICTORIAL DISPLAY.
AD-625 107 FLD. 5/10

•RECALL
WORD ASSOCIATION
REPRINT: MANIPULATION OF STRATEGIES OF REPORT IN DICHOTICLISTENING.
AD-625 106 FLD. 5/10

•RECOMBINATION REACTIONS
DISSOCIATION
ELECTRONIC AND IONIC COLLISION PROCESSES.
AD-625 313 FLD. 20/8

NITROGEN COMPOUNDS
REPRINT: ELECTRON-ION RECOMBINATION IN NITRICOXIDE IN THE TEMPERATURE RANGE 196 TO 398K.
AD-625 110 FLD. 7/4

•RECORDING SYSTEMS
IONOSPHERIC PROPAGATION
REPRINT: ELECTROMECHANICAL VERSION OF THE IGY RIOMETER.
AD-625 083 FLD. 14/2

•RECRYSTALLIZATION
METALS
TRANSLATION OF RUSSIAN RESEARCH: STRUCTURAL IMPERFECTIONSOF METALS DURING RECRYSTALLIZATION.
AD-625 154 FLD. 11/6

•RECTIFIERS
SILICON
PRODUCTION ENGINEERING MEASURE. HIGH VOLTAGE SILICONRECTIFIER STACKS.
AD-625 425 FLD. 9/1

•RECURSIVE FUNCTIONS
CODING
RECURSIVE PROCEDURES: IMPLEMENTATION ON IBM 7080COMPUTER BY USING THE 7058 FORTRAN PROCESSOR.
AD-625 322 FLD. 12/1

•REFRACTORY METALS
RECRYSTALLIZATION
TRANSLATION OF RUSSIAN RESEARCH: RECRYSTALLIZATION OFHIGH-MELTING METALS IN WELDING AND SOLDERING.
AD-624 909 FLD. 13/8

SHEETS
EVALUATION TEST METHODS FOR REFRACTORY METAL SHEETMATERIALS.
AD-625 606 FLD. 14/2

•REINFORCING MATERIALS
GLASS TEXTILES
INFLUENCE OF ENVIRONMENT ON ROVING AND LAMINATEPROPERTIES.
AD-625 030 FLD. 11/5

•RELATIVITY THEORY
PARTICLES
REPRINT: TRANSFORMATION FROM A LINEAR MOMENTUM TO ANANGULAR MOMENTUM BASIS FOR RELATIVISTIC PARTICLES OF NONZERO MASS AND ANY SPIN.
AD-624 869 FLD. 20/10

•RELAXATION OSCILLATORS
TRANSISTORS
TRANSLATION OF RUSSIAN PATENT: SYMMETRICAL FLIPFLOP.
AD-625 063 FLD. 9/5

•RELAXATION TIME
ATOMIC ENERGY LEVELS
REPRINT: MANY-SHOT EXPANSION TECHNIQUE FOR ANALYZINGRELAXATION PROCESSES IN A MULTILEVEL SYSTEM.
AD-625 602 FLD. 7/4

COLOR CENTERS
CONCENTRATION DEPENDENCE OF SPIN-LATTICE RELAXATION TIMEOF COLOR CENTERS IN QUARTZ.
AD-625 098 FLD. 20/2

•RELIABILITY
DETERMINATION
TRANSLATION OF RUSSIAN RESEARCH: CALCULATING THEINTERDEPENDENCE OF MACHINE SUBASSEMBLIES IN DETERMININGRELIABILITY.
AD-625 301 FLD. 14/4

•RELIABILITY(ELECTRONICS)
COMMUNICATION SYSTEMS
REPRINT: A NOTE ON THE RELIABILITY OF COMMUNICATION NETWORKS.
AD-625 652 FLD. 14/4

•REMOTE CONTROL SYSTEMS
HYDRAULIC DEVICES
TRANSLATION OF RUSSIAN PATENT: BELLOWS TYPE DEVICEFOR HYDRAULIC REMOTE CONTROL OF AN ACTUATOR.
AD-625 184 FLD. 13/7

•RESEARCH PROGRAM ADMINISTRATION
COSTS
EFFICIENT ACHIEVEMENT OF RAPID TECHNOLOGICAL PROGRESSA MAJOR NEW PROBLEM IN PUBLIC FINANCE.
AD-625 972 FLD. 5/1

•RESISTANCE(ELECTRICAL)
STABILITY
INSTABILITY OF NEGATIVE DIFFERENTIAL RESISTANCE.
AD-625 273 FLD. 20/3

•RHENIUM
PHYSICAL PROPERTIES
TRANSLATION OF RUSSIAN RESEARCH: PROPERTIES AND USES OFRHENIUM.
AD-624 905 FLD. 11/6

•ROCK(GEOLOGY)
ULTRAVIOLET SPECTROSCOPY
RESPONSE OF SELECTED ROCK SPECIMENS TO VACUUM ULTRAVIOLET LIGHT.
AD-625 393 FLD. 8/7

•ROCKET CASES
STRESSES
EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OFPROPELLANT GRAINS AND MOTOR CASES DUE TO THERMALLOADING OF THE SHRINKAGE TYPE. STRESSES IN SQUARE SLABS,WITH DIFFERENT EDGE GEOMETRIES, WHEN BONDED ON ONE FACETO A RIGID PLATE AND SHRUNK.
AD-625 220 FLD. 21/9

•ROCKET FUELS
FUEL ADDITIVES
TRANSLATION OF A RUSSIAN PATENT: METHOD OFIMPROVING THE THERMO-OXIDATION STABILITY OF HYDROCARBONFUELS WITH MERCAPTAN ADDITIVES.
AD-625 247 FLD. 21/4

•ROCKET MOTORS(LIQUID PROPELLANT)
STABILITY
TRANSLATION OF RUSSIAN RESEARCH: LOW FREQUENCY INSTABILITYOF THE NOMINAL REGIME OF A LIQUID ROCKET ENGINE.
AD-625 298 FLD. 21/8.1

•ROCKET MOTORS(SOLID PROPELLANT)
MATERIALS
FINITE DEFORMATIONS UNDER PRESSURIZATION IN AN INFINITELYLONG, THICK-WALLED, NONLINEARLY VISCOELASTIC CYLINDERIDEALLY BONDED TO A THIN ELASTIC CASE.
AD-625 219 FLD. 20/11

•ROCKET PROPELLANT GRAINS
STRESSES
EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OFPROPELLANT




799-657 O - 66 - 10

GRAINS AND MOTOR CASES DUE TO THERMALLOADING OF THE SHRINKAGE TYPE. STRESSES IN SQUARE SLABS,WITH DIFFERENT EDGE GEOMETRIES, WHEN BONDED ON ONE FACETO A RIGID PLATE AND SHRUNK.
AD-629 220 FLD. 21/9

•ROCKET PROPELLANTS
COMBUSTION PRODUCTS
ROCKET ENGINE EXHAUST PRODUCTS: THERMODYNAMICPROPERTIES.
AD-629 598 FLD. 21/9

THERMODYNAMICS
THERMODYNAMIC PROPERTIES OF PROPELLANT COMBUSTIONPRODUCTS.
AD-629 099 FLD. 21/2

•ROCKET TRAJECTORIES
AERODYNAMICS
A FLOW MODEL AND ANALYSIS OF A ROCKET PAIR IN CLOSEPROXIMITY.
AD-629 566 FLD. 19/9

•ROCKETS
GUIDANCE
TRANSLATION OF RUSSIAN RESEARCH: ANALYTICAL CONSTRUCTIONOF THE GUIDANCE SYSTEM OF ROCKETS.
AD-629 093 FLD. 16/2

•ROTOR BLADES(ROTARY WINGS)
AERODYNAMIC LOADING
AIR LOADINGS ON A ROTOR BLADE AS CAUSED BY TRANSIENTINPUTS OF COLLECTIVE PITCH.
AD-629 860 FLD. 1/1

•RUBIDIUM
MASERS
REPRINT: THE EFFECTS OF OPTICAL PUMPING ON THE RB87MASER OSCILLATOR.
AD-629 929 FLD. 20/5

RESISTANCE(ELECTRICAL)
REPRINT: EFFECT OF PRESSURE AND TEMPERATURE ON THE ELECTRICAL RESISTANCE OF RUBIDIUM AND CAESIUM.
AD-629 970 FLD. 11/6

•RUBY
FLUORESCENCE
EFFECT OF GAMMA RADIATION ON FLUORESCENCE OF RUBY:TRANSLATION OF RUSSIAN ARTICLE.
AD-629 299 FLD. 20/2

GAMMA RAYS
EFFECT OF GAMMA RADIATION ON FLUORESCENCE OF RUBY:TRANSLATION OF RUSSIAN ARTICLE.
AD-629 299 FLD. 20/2

PUMPING(OPTICAL)
LASER-PUMPED LASER.
AD-629 938 FLD. 20/5

•SALMONELLA
AGGLUTININS
TRANSLATION OF RUSSIAN RESEARCH: STIMULATION OF TYPHOIDAGGLUTININS UNDER THE INFLUENCE OF THE Ev PLAGUE VACCINE.
AD-629 608 FLD. 6/13

VACCINES
TRANSLATION OF RUSSIAN RESEARCH: IMMUNOLOGICAL ACTIVITYOF LYMPHOID ORGANS DURING AEROSOL AND SUBCUTANIOUSTYPHOID IMMUNIZATION.
AD-629 631 FLD. 6/13

•SALTS
MELTING
REPRINT: VISCOSITY MEASUREMENTS OF IONIC MELTS ATTEMPERATURES TO 1100C.
AD-629 936 FLD. 7/4

•SARIN
COUNTERMEASURES
REPRINT: PENETRATION OF GUINEA PIG AND RABBIT SKIN BYDIMETHYL SULFOXIDE SOLUTIONS OF A QUATERNARY OXIME.
AD-629 939 FLD. 6/15

•SATELLITE ANTENNAS
TELEMETERING ANTENNAS
TELEMETRY ANTENNA FOR LINCOLN EXPERIMENTAL SATELLITESLES-1 AND LES-2.
AD-629 936 FLD. 9/6

•SATELLITES(ARTIFICIAL)
ASTRONOMICAL GEODESICS
RESULTS OF SPACE TRIANGULATION ADJUSTMENTS FROM SATELLITEDATA.
AD-629 298 FLD. 8/4

•SCIENTIFIC RESEARCH
DIRECTORIES
HUMID TROPICS RESEARCH: DIRECTORY OF INSTITUTIONS FORTHE INTERNATIONAL GEOGRAPHICAL UNION.
AD-629 427 FLD. 8/6

DOCUMENTATION
REPRINT: PROPOSAL FOR ESTABLISHMENT OF A NATIONALTECHNICAL INFORMATION SYSTEM.
AD-629 496 FLD. 5/2

REVIEWS
FOREIGN SCIENCE BULLETIN, 1969, VOL. 1, NO. 12.
AD-629 340 FLD. 5/1

•SCIENTIFIC SATELLITES
USSR
TRANSLATION OF RUSSIAN REPORT: FIVE YEARS OF SOVIETSPACE INVESTIGATION.
AD-629 300 FLD. 22/2

•SCINTILLATION
RADIO WAVES
EXPERIMENTAL INVESTIGATION OF THE COHERENCE DISTANCE OFTHE ATMOSPHERE FOR MICROWAVES.
AD-629 991 FLD. 20/14

•SEAPLANES
TAKE-OFF
EFFECT OF WAVES, LOADING, AND CONFIGURATION ON THE TAKE-OFFPERFORMANCE OF WATER-BASED AIRCRAFT.
AD-629 368 FLD. 1/2

•SECONDARY FLOW
VORTICES
AERODYNAMIC PERFORMANCE OF REVERSED FLOW VORTEXCHAMBERS.
AD-629 405 FLD. 14/2

•SEISMIC WAVES
NOISE
ARRAY RESEARCH.
AD-629 996 FLD. 8/11

•SEISMOGRAPHS
CONFIGURATION
ARRAY RESEARCH.
AD-629 996 FLD. 8/11

STRAIN(MECHANICS)
MULTICOMPONENT STRAIN SEISMOGRAPH.
AD-629 918 FLD. 8/11

•SEISMOLOGICAL STATIONS
ARIZONA
TONTO FOREST SEISMOLOGICAL OBSERVATORY.
AD-629 969 FLD. 8/11
OPERATION OF THE TONTO FOREST SEISMOLOGICAL OBSERVATORYIN ARIZONA.
AD-629 969 FLD. 8/11

DATA PROCESSING SYSTEMS
MULTIPLE ARRAY PROCESSOR.
AD-629 991 FLD. 8/11
MULTIPLE ARRAY PROCESSOR.
AD-629 999 FLD. 8/11
MULTIPLE ARRAY PROCESSOR.
AD-629 607 FLD. 8/11

INSTRUMENTATION
OPERATION OF THE BLUE MOUNTAINS SEISMOLOGICAL OBSERVATORYAND THE UNITA BASIN SEISMOLOGICAL OBSERVATORY, LOCATEDIN OREGON AND UTAH.
AD-629 960 FLD. 8/11
OPERATION OF THE BLUE MOUNTAINS SEISMOLOGICAL OBSERVATORYAND THE UINTA BASIN SEISMOLOGICAL OBSERVATORY,LOCATED IN OREGON AND UTAH.
AD-629 961 FLD. 8/11
OPERATION OF THE TONTO FOREST SEISMOLOGICAL OBSERVATORY.
AD-629 967 FLD. 8/11
OPERATIONS OF THE BLUE MOUNTAINS SEISMOLOGICAL OBSERVATORY, OREGONI CUMBERLAND PLATEAU SEISMOLOGICALOBSERVATORY, TENNESSEE; VINTA BASIN SEISMOLOGICALOBSERVATORY, UTAH.
AD-629 516 FLD. 8/11

OKLAHOMA
OPERATION OF THE WICHITA MOUNTAINS SEISMOLOGICALOBSERVATORY.
AD-629 962 FLD. 8/11

TENNESSEE
CUMBERLAND PLATEAU SEISMOLOGICAL OBSERVATORY,TENNESSEE.
AD-629 992 FLD. 8/11
CUMBERLAND PLATEAU SEISMOLOGICAL OBSERVATORY,TENNESSEE.
AD-629 993 FLD. 8/11

UNDERGROUND STRUCTURES
EVALUATION OF SEISMOMETERS LOCATED IN DEEP WELLS.
AD-629 914 FLD. 8/11
EVALUATION OF SEISMOMETERS LOCATED IN DEEP WELLS.
AD-629 915 FLD. 8/11

•SEISMOLOGY
DATA PROCESSING SYSTEMS
SEISMOLOGY: ANALYSIS OF VARIANCE AS A METHOD OF AUTOMATICSIGNAL DETECTION.
AD-629 945 FLD. 8/11
SEISMOLOGY: APPLICATION OF PARTIAL COHERENCY TECHNIQUESTO THE PROBLEM OF PROCESSING SEISMIC DATA.
AD-629 947 FLD. 8/11

EARTHQUAKES
LONG RANGE SEISMIC MEASUREMENTS OF NEW MADRID,MISSOURI EARTHQUAKE.
AD-629 999 FLD. 8/11

MAGNETIC RECORDING SYSTEMS
EXPLORATORY MEETING ON THE MAGNETIC TAPE RECORDINGOF SEISMIC DATA.
AD-629 199 FLD. 17/10

PERIODICALS
VESIAC MONTHLY BULLETIN OF VELA UNIFORM RESEARCHPUBLICATIONS.
AD-629 006 FLD. 8/11
VESIAC MONTHLY BULLETIN OF VELA UNIFORM RESEARCHPUBLICATIONS.
AD-629 221 FLD. 8/11

•SELECTION RULES
FIELD THEORY
REPRINT: SELECTION RULES FOR PARAFIELDS AND THE ABSENCEOF PARA PARTICLES IN NATURE.
AD-629 572 FLD. 20/10

•SEMANTICS
WORD ASSOCIATION
DEVELOPMENTAL STUDY OF THE SEMANTIC DIFFERENTIAL.
AD-625 903 FLD. 9/10

•SEMICONDUCTOR DEVICES
FREQUENCY STABILIZERS
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
AD-625 316 FLD. 14/2

RADIATION DAMAGE
SEMICONDUCTOR RADIATION RESPONSE PREDICTION: GENERALIZEDMODEL.
AD-625 341 FLD. 18/8

RADIOFREQUENCY GENERATORS
TUNABLE SOLID STATE K-BAND GENERATOR.
AD-625 310 FLD. 9/5

•SEMICONDUCTORS
CHELATE COMPOUNDS
TRANSLATION OF RUSSIAN RESEARCH: SEMICONDUCTING ANDOPTICAL PROPERTIES OF DITHIOCARBAMATES OF COPPER, NICKEL,ZINC AND CADMIUM.
AD-625 153 FLD. 20/12

CHEMISTRY
TRANSLATION OF RUSSIAN RESEARCH: PROBLEMS OF SEMICONDUCTOR CHEMISTRY.
AD-625 146 FLD. 7/2

CRYSTAL LATTICES
REPRINT: NUCLEAR SPIN RELAXATION IN PI-TYPE INSB ATLIQUID-HELIUM TEMPERATURES.
AD-625 978 FLD. 20/12

FIBERS
TRANSLATION OF RUSSIAN RESEARCH: SYNTHESIS OF SEMICONDUCTING COMPOSITES BY RADIATION GASEOUS-PHASEPOLYMERIZATION.
AD-624 912 FLD. 11/9

LASERS
GAAS INJECTION LASER INVESTIGATION.
AD-624 939 FLD. 20/5

SOLID STATE PHYSICS
PHYSICAL RESEARCH ON PROPERTIES OF II-VI COMPOUNDSEMICONDUCTORS.
AD-625 976 FLD. 20/12

THERMOCOUPLES
TRANSLATION OF RUSSIAN RESEARCH: THERMOELECTRICCOOLING AND ITS PRACTICAL APPLICATION.
AD-625 292 FLD. 13/1

•SENDAI VIRUS
FATTY ACIDS
TRANSLATION OF RUSSIAN RESEARCH: GAS-LIQUIDCHROMATOGRAPHY OF METHYL ETHERS OF HIGHER FATTY ACIDSOF SENDAI VIRUS LIPID COMPONENT.
AD-625 626 FLD. 6/1

•SENSORY DEPRIVATION
AUDITORY ACUITY
REPRINT: AUDITORY SENSITIVITY AFTER PROLONGED VISUALDEPRIVATION.
AD-625 928 FLD. 6/16

•SEQUENTIAL ANALYSIS
DECISION MAKING
TIMELINESS AND ACCURACY IN A SEQUENTIAL DECISION MAKINGTASK.
AD-625 223 FLD. 5/9

DECISION THEORY
GENERAL THEORY OF FINITE SEQUENTIAL DECISION PROCESSES.
AD-625 048 FLD. 12/1

•SERIES
TIME
A CHANGE IN LEVEL OF A NON-STATIONARY TIME SERIES.
AD-625 496 FLD. 12/1

•SERRATIA MARCESCENS
BACTERIAL AEROSOLS
TRANSLATION OF RUSSIAN RESEARCH: POSSIBILITY OF USING BPRODIGIOSUM AS AN EXPERIMENTAL BACTERIAL AEROSOLMODEL.
AD-625 616 FLD. 6/13

•SET THEORY
ELECTRICAL NETWORKS
SET OF CUT SETS AND OPTIMUM FLOW.
AD-625 200 FLD. 9/1

MATRIX ALGEBRA
REPRINT: MINIMUM PARTITION OF A MATROID INTO INDEPENDENTSUBSETS.
AD-625 905 FLD. 12/2
REPRINT: LEHMAN'S SWITCHING GAME AND A THEOREM OFTUTTE AND NASH-WILLIAMS.
AD-625 906 FLD. 12/2

•SHAFTS
STRAIN(MECHANICS)
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF LOCAL STRAINDURING BENDING OF A HOLLOW SHAFT.
AD-625 249 FLD. 20/11

•SHELTERS
CONSTRUCTION
POTENTIAL OF MASS PRODUCTION FOR REDUCING COSTS IN SHELTERCONSTRUCTION, A PRELIMINARY SURVEY.
AD-625 238 FLD. 13/13

•SHIELDING
GLASS
RADIATION ABSORBING GLASS.
AD-624 874 FLD. 11/2

•SHIP HULLS
VIBRATION
SHIP HULL VIBRATIONS: A GUIDE FOR DESIGN STAGE CALCULATIONSOF PROPELLER EXCITED VIBRATIONS.
AD-625 385 FLD. 13/10

•SHIP MODELS
WAKE
WAKE ANALYSIS OF SHIP MODELS; SINGLE-SCREW MERCHANTTYPE.
AD-625 327 FLD. 13/10

•SHIP STRUCTURAL COMPONENTS
PLASTICS
TRANSLATION OF RUSSIAN RESEARCH: PLASTIC MARINE FITTINGS.
AD-625 614 FLD. 13/10

•SHOCK WAVES
RESISTANCE(ELECTRICAL)
ELECTRICAL EFFECTS OF SHOCK WAVES: CONDUCTIVITY IN CSI, KI,AND NACL.
AD-625 568 FLD. 20/11

•SHOCK(PATHOLOGY)
HEART
REPRINT: MYOCARDIAL CATECHOLAMINES AND STIMULATIONOF THE STELLATE GANGLION IN HEMORRHAGIC SHOCK.
AD-625 279 FLD. 6/5

•SHORT TAKE-OFF PLANES
HANDLING
ANALYTICAL STUDY OF V/STOL HANDLING QUALITIES IN HOVER ANDTRANSITION.
AD-625 599 FLD. 1/2

•SIGNALS
STATISTICAL ANALYSIS
REPRINT: STOCHASTIC SIGNAL PARAMETER ESTIMATION.
AD-624 866 FLD. 9/4

•SIGNAL-TONOISE RATIO
ELECTROMAGNETIC PULSES
TRANSLATION OF CHINESE RESEARCH BULLETIN: HIGH POWERRUBY LASER AND SIGNAL-TO-NOISE RATIO IN THE DATASAMPLING PROCESS.
AD-625 090 FLD. 14/2

•SILANES
CHEMICAL REACTIONS
TRANSLATION OF RUSSIAN RESEARCH: REACTIONS OF CHLOROMETHYLSILANES AND SILOXANE WITH DEHYDRIC PHENOLS.
AD-625 613 FLD. 11/9

PYROLYSIS
REPRINT: THERMAL DECOMPOSITION OF TRIPHENYLSILYLHYDROPEROXIDE.
AD-625 648 FLD. 7/3

•SILICATES
LIQUIDS
REPRINT: IONIC DISTRIBUTION IN LIQUID SILICATES.
AD-624 962 FLD. 7/4

RELAXATION TIME
RELAXATION OF DILUTED NICKEL FLUOSILICATE AT LOW TEMPERATURESBY STEADY-STATE RESONANCE ABSORPTION TECHNIQUES.
AD-625 594 FLD. 20/12

•SILICON
ELECTRON BOMBARDMENT
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIESIN ORGANIC AND INORGANIC MATERIALS.
AD-624 884 FLD. 20/12

PHASE STUDIES
PHASE EQUILIBRIUM STUDIES OF GERMANIUM AND SILICONAT HIGH PRESSURES.
AD-625 928 FLD. 20/12

TRANSISTORS
PRODUCTION ENGINEERING MEASURE FOR SILICON OVERLAYTRANSISTORS.
AD-625 217 FLD. 9/1

•SILICONE PLASTICS
PREPARATION
TRANSLATION OF RUSSIAN RESEARCH: REACTIONS OF CHLOROMETHYLSILANES AND SILOXANE WITH DEHYDRIC PHENOLS.
AD-625 613 FLD. 11/9

•SILOXANES
CHEMICAL REACTIONS
TRANSLATION OF RUSSIAN RESEARCH: REACTION OFORGANOCYCLOSILAZANE WITH DIHYDROXY POLYORGANOSILOXANES.
AD-625 084 FLD. 11/10
TRANSLATION OF RUSSIAN RESEARCH: REACTIONS OF CHLOROMETHYLSILANES AND SILOXANE WITH DEHYDRIC PHENOLS.
AD-625 613 FLD. 11/9

•SILVER ALLOYS
STRESS CORROSION
REPRINT: MECHANISMS OF TRANSGRANULAR STRESS CORROSIONCRACKING OF SOLID SOLUTION ALLOYS.
AD-625 584 FLD. 11/6

•SINGLE SIDEBAND COMMUNICATION SYSTEMS
TRANSISTORS
TRANSISTOR, VHF, SILICON, POWER, LINEAR, 30-MC, 100WATTS PEP.
AD-625 329 FLD. 9/1

•SKIN
PERMEABILITY
REPRINT: PENETRATION OF GUINEA PIG AND RABBIT SKIN BYDIMETHYL

SULFOXIDE SOLUTIONS OF A QUATERNARY OXIME.
AD-629 939 FLD. 6/19

•SKY BRIGHTNESS
NUMERICAL ANALYSIS
NUMERICAL ESTIMATES OF LUMINANCE AND TOTAL BRIGHTNESS OFTHE TERRESTRIAL HALO.
AD-629 233 FLD. 4/1

•SLEEP
ELECTROPHYSIOLOGY
REPRINT: L'ACTIVITE ELECTRIQUE PHASIQUE DU CORTEX ET DUTHALAMUS AU COURS DU SOMMEIL DESYNCHRONISE CHEZ LECHAT (PHASIC ELECTRICAL ACTIVITY OF THE CORTEX AND OF THETHALAMUS DURING DESYNCHRONIZED SLEEP OF THE CAT).
AD-629 342 FLD. 6/16

•SOCIAL COMMUNICATION
DECISION MAKING
REPRINT: INTERACTION PROCESS AND TASK OUTCOME INEXPERIMENTALLY-CREATED NEGOTIATION GROUPS.
AD-629 988 FLD. 5/10

PSYCHOPHYSIOLOGY
BASES AND CONSEQUENCES OF SYSTEMS OF COMMUNICATION.
AD-629 922 FLD. 5/10

•SOCIAL PSYCHOLOGY
BARGAINING
REWARD STRUCTURE AND INFORMATION IN THE DEVELOPMENT OFCOOPERATION IN TWO-PERSON, TWO-CHOICE GAMES.
AD-629 920 FLD. 5/10
TECHNIQUES OF INDUCING COOPERATION BETWEEN ADVERSARIES.
AD-629 921 FLD. 5/10

DECISION MAKING
ROLE ASSIGNMENT AND ATTITUDINAL COMMITMENT AS FACTORSIN NEGOTIATION.
AD-629 387 FLD. 5/10

STRESS(PSYCHOLOGY)
BASES AND CONSEQUENCES OF SYSTEMS OF COMMUNICATION.
AD-629 922 FLD. 5/10

•SODIUM
CORROSIVE LIQUIDS
TRANSLATION OF RUSSIAN RESEARCH: PROBLEM OF THE BEHAVIOROF HEAT RESISTANT ALLOYS IN CONTACT WITH SODIUM IN STRESSEDSTATE.
AD-629 148 FLD. 11/6

•SODIUM COMPOUNDS
IODIDES
ATOMIC FLUORESENCE OF SODIUM IODIDE.
AD-629 029 FLD. 7/4

KETONES
REPRINT: TETRASODIO BIS-BETA-DIKETONES. DICONDENSATIONSWITH ELECTROPHILIC COMPOUNDS.
AD-629 639 FLD. 7/3

•SOIL MECHANICS
POROUS MATERIALS
THEORIES ON THE CONSOLIDATION OF A SOIL SYSTEM IN A POROELASTIC CONTINUUM.
AD-629 892 FLD. 8/13

TEST EQUIPMENT
AERIAL CONE PENETROMETER: DEMONSTRATION FOR DETERMININGTRAFFICABILITY OF SOILS.
AD-629 601 FLD. 14/2

TEST METHODS
LABORATORY STUDIES ON THE EFFECTS OF LABORATORY SIMULATEDEARTHQUAKE LOADINGS ON CONESIVE SOIL STRENGTH, SAN LUIS DAMAND CANAL--SAN LUIS UNIT CENTRAL VALLEY PROJECT, CALIFORNIA.
AD-629 993 FLD. 8/13

•SOILS
PENETRATION
AERIAL CONE PENETROMETER: DEMONSTRATION FOR DETERMININGTRAFFICABILITY OF SOILS.
AD-629 601 FLD. 14/2

TRAFFICABILITY
EFFECTS OF WET SURFACE SOIL CONDITIONS ON THE PERFORMANCEOF A SINGLE PNEUMATIC-TIRED WHEEL.
AD-629 390 FLD. 13/6

•SOLAR ATMOSPHERE
THERMODYNAMICS
REPRINT: THERMODYNAMICS OF A SOLAR COMPOSITIONGASEOUS MIXTURE.
AD-629 939 FLD. 3/2

•SOLAR CELLS
ELECTRON BOMBARDMENT
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIESIN ORGANIC AND INORGANIC MATERIALS.
AD-629 889 FLD. 20/12

REFLECTORS
TRANSLATION OF RUSSIAN PATENT: METHOD OF PROTECTING THEWORKING SURFACE OF SOLAR BATTERIES.
AD-629 186 FLD. 10/2

SILICON
SILICON SOLAR CELLS: RADIATION DAMAGE, FROM 4.6-MEVPROTON BOMBARDMENT.
AD-629 990 FLD. 10/2

•SOLAR DISTURBANCES
ASTRONOMICAL DATA
CLASSIFICATION OF SOLAR PROMINENCES FOR SUNSPOT CYCLENO. 19 - 1962.
AD-629 381 FLD. 3/2

•SOLAR ECLIPSES
RADIO ASTRONOMY
REPRINT: COSMIC NOISE AND MAGNETIC MEASUREMENTSAT CALGARY DURING THE SOLAR ECLIPSE OF JULY 20, 1963.
AD-629 108 FLD. 3/2

•SOLAR FLARES
MATHEMATICAL PREDICTION
DEVELOPING A SYSTEM OF SOLAR FLARE PREDICTION.
AD-629 938 FLD. 3/2

•SOLAR RADIATION
ATMOSPHERIC REFRACTION
SCATTERING OF SUNLIGHT INTO PLANETARY SHADOW CONES.
AD-629 260 FLD. 4/1

ULTRAVIOLET SPECTROSCOPY
REPRINT: ABSOLUTE INTENSITY MEASUREMENTS IN THE EXTREMEULTRAVIOLET SPECTRUM OF SOLAR RADIATION.
AD-629 129 FLD. 20/6

•SOLAR SPECTRUM
INFRARED RADIATION
BALLOON BORNE INFRARED STUDIES.
AD-629 399 FLD. 4/1

ULTRAVIOLET RADIATION
REPRINT: SOLAR XUV SPECTRUM OF MARCH, 1964.
AD-629 131 FLD. 3/2
REPRINT: ROCKET SPECTRA OF THE CHROMOSPHERE.
AD-629 134 FLD. 3/2

•SOLAR SYSTEMS
PLASMA PHYSICS
REPRINT: SOLAR SYSTEM MAGNETIC FIELDS AND PLASMAS.
AD-629 178 FLD. 3/2

•SOLDERING
COPPER
TRANSLATION OF RUSSIAN RESEARCH: SPECIFIC FEATURES INSOLDERING COPPER WITH GALLIUM-BASE SOLDERS.
AD-629 149 FLD. 13/8

•SOLID ROCKET PROPELLANTS
COMBUSTION
RESPONSE OF A BURNING SOLID PROPELLANT TO PRESSURE WAVESOF FINITE AMPLITUDE.
AD-629 999 FLD. 21/9

•SOLID STATE PHYSICS
INFRARED SPECTROSCOPY
REPRINT: CHARACTERISTIC FREQUENCIES FROM INFRARED ANDELASTIC DATA.
AD-629 166 FLD. 20/12

POWER AMPLIFIERS
HIGH SPEED POWER AMPLIFIER USING AN ELECTRON SWITCHEDP-N JUNCTION.
AD-629 920 FLD. 9/5

SCIENTIFIC RESEARCH
CONSOLIDATED SEMIANNUAL PROGRESS REPORT NO. 2, 1 APRIL1965 THROUGH 30 SEPTEMBER 1965, BY ELECTRONICS SCIENCESLABORATORY, UNIVERSITY OF SOUTHERN CALIFORNIA.
AD-629 971 FLD. 20/12

•SOLIDS
ADHESION
TRANSLATION OF RUSSIAN RESEARCH: THE INVALIDITY OF APURELY THERMODYNAMIC TREATMENT OF THE ADHESION OFSOLIDS.
AD-629 603 FLD. 7/4

•SOLVENTS
CARBON
LUBRICATION RESEARCH FOR AERO PROPULSION SYSTEMS: EFFECTOF AIRCRAFT GAS TURBINE ENGINE LUBRICANTS AND VARIOUSSOLVENTS ON REMOVAL OF CARBON DEPOSITS ON BEARING REARSUPPORT.
AD-629 989 FLD. 11/8

•SONIC BOOM
PUBLIC OPINION
COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITYAREA. DATA ON COMMUNITY REACTIONS AND INTERPRETATIONS.
AD-629 332 FLD. 1/3

•SORPTION
DEUTERIUM
HYDROGEN AND DEUTERIUM CLEANUP.
AD-629 389 FLD. 9/1

•SOUND
AERODYNAMIC CHARACTERISTICS
FLUID MOTION AND SOUND: PROGRESS REPORTS.
AD-629 087 FLD. 20/4

PROPAGATION
REPRINT: LONGITUDINAL WAVES IN A WEAKLY IONIZED GAS:SOUND PROPAGATION.
AD-629 879 FLD. 20/9
PROPAGATION PATH OF A WAVE IN A VARIABLE SPEED OF SOUNDMEDIUM OBTAINED BY EMPLOYING FERMAT'S PRINCIPLE.
AD-629 089 FLD. 20/14

•SOUNDING ROCKETS
INSTRUMENTATION
EVALUATION OF METEOROLOGICAL

ROCKET WIND SENSORS.
AD-629 388 FLD. 4/2
SOUNDING ROCKET: DESIGN, DEVELOPMENT AND FLIGHT TESTRESULTS OF THE LOKI INSTRUMENTED DART SYSTEM.
AD-629 481 FLD. 4/2

METEOROLOGY
SYMPOSIUM ON METEOROLOGICAL ROCKETS.
AD-629 354 FLD. 14/2

TRACKING
PERFORMANCE OF THE AN/GMD-2 RAWIN SET IN THE DENPROSYSTEM.
AD-629 118 FLD. 14/2

•SPACE FLIGHT
INTERPLANETARY TRAJECTORIES
REPRINT: AN OPTIMAL DISCRETE CONTROL STRATEGY FOR INTERPLANETARY GUIDANCE.
AD-629 982 FLD. 22/3

USSR
TRANSLATION OF RUSSIAN REPORT: FIVE YEARS OF SOVIETSPACE INVESTIGATION.
AD-629 300 FLD. 22/2

•SPACE PERCEPTION
PHOTOGRAMMETRY
INVESTIGATION OF FUSION AND FIXATION DISPARITY LIMITS FORPHOTOGRAMMETRY.
AD-629 217 FLD. 5/10

•SPECIAL FUNCTIONS(MATHEMATICAL)
ALGEBRAIC GEOMETRY
ZETA FUNCTION OF A HYPERSURFACE.
AD-629 477 FLD. 12/1

•SPECTROPHOTOMETERS
ASTRONOMICAL OBSERVATORIES
REPRINT: A DUAL-CHANNEL PULSE-COUNTING ASTRONOMICALSPECTROPHOTOMETER.
AD-629 882 FLD. 3/2

•SPECTROSCOPY
STARS
SPECTRAL CLASSIFICATION AND SPECTROSCOPIC STUDIES.
AD-629 493 FLD. 3/2

•SPECTRUM ANALYZERS
CRYSTALS
REPRINT: APPARATUS FOR MEASUREMENT OF THE LUMINESCENCESPECTRA OF CRYSTALS AT N.R.C. OTTAWA.
AD-629 959 FLD. 14/2

MOLECULAR SPECTROSCOPY
HIGH RESOLUTION ECHELLE VACUUM SPECTROGRAPH APPLIED TOMEASUREMENT OF MOLECULAR CONSTANTS OF THE $1\Sigma^{+}$ STATEOF NO(+).
AD-629 337 FLD. 20/6

TRANSDUCERS
TRANSLATION OF A RUSSIAN PATENT: TRANSDUCER OFSPECTROMETER OF ELECTRONIC PARAMAGNETIC RESONANCE.
AD-629 009 FLD. 20/6

•SPEECH
INTELLIGIBILITY
COMMUNICATION BY VOICE.
AD-629 861 FLD. 17/2.1
REPRINT: SPEAKING AND LISTENING THROUGH THE HEAD:THE INTELLIGIBILITY OF SPEECH RECORDED IN QUIET AT DIFFERENTPOSITIONS ON THE HEAD AND THROAT.
AD-629 104 FLD. 17/2
SPEECH INTERFERENCE ASPECTS OF NAVY NOISES. CALCULATIONSSHOW SPEECH INTERFERENCE MEASUREMENTS ARE SIMPLIFIEDBY AVERAGING SOUND PRESSURE LEVELS IN MID-FREQUENCYOCTAVES.
AD-629 262 FLD. 5/5

•SPEECH RECOGNITION
AUTOMATIC
TRANSLATION OF RUSSIAN RESEARCH: AUTOMATIC RECOGNITIONOF SPEAKING PERSONS.
AD-629 309 FLD. 17/2

•SPEECH TRANSMISSION
BONE
REPRINT: SPEAKING AND LISTENING THROUGH THE HEAD:THE INTELLIGIBILITY OF SPEECH RECORDED IN QUIET AT DIFFERENTPOSITIONS ON THE HEAD AND THROAT.
AD-629 104 FLD. 17/2

•SPHERES
DRAG
SPHERE DRAG AT HIGH KNUDSEN NUMBER AND LOW MACHNUMBER.
AD-629 622 FLD. 20/4

•STAINLESS STEEL
STRESS CORROSION
REPRINT: MECHANISMS OF TRANSGRANULAR STRESS CORROSIONCRACKING OF SOLID SOLUTION ALLOYS.
AD-629 994 FLD. 11/6

•STANDING WAVE RATIOS
WAVEGUIDES
MEASUREMENT TECHNIQUES FOR OVERSIZED WAVEGUIDE.
AD-629 492 FLD. 9/1

•STAPHYLOCOCCUS
DISTRIBUTION
TRANSLATION OF RUSSIAN RESEARCH: DYNAMICS OF A BACTERIALAEROSOL IN THE DUST AND DROP PHASE.
AD-629 619 FLD. 15/2

•STARS
CLASSIFICATION
SPECTRAL CLASSIFICATION AND SPECTROSCOPIC STUDIES.
AD-629 493 FLD. 3/2

OPTICAL PHENOMENA
SEARCH FOR PLANETARY OPTICAL EMISSION, AND STUDY OF FLAREACTIVITY OF NEARBY STARS.
AD-629 899 FLD. 3/2

SPECTROSCOPY
INVESTIGATION OF O AND B SPECTRA OF STARS.
AD-629 032 FLD. 3/2

•STATIC ELECTRICITY
AIRCRAFT
CORRELATION BETWEEN CLEAR-AIR TURBULENCE AND AIRCRAFTELECTRICAL ACTIVITY.
AD-629 309 FLD. 4/1

•STATISTICAL ANALYSIS
OPTIMIZATION
A CHANGE IN LEVEL OF A NON-STATIONARY TIME SERIES.
AD-629 456 FLD. 12/1

•STATISTICAL DATA
ARCHEOLOGY
STATISTICAL METHODS OF TIME SEQUEING.
AD-629 560 FLD. 12/1

•STATISTICAL FUNCTIONS
CORRELATORS
SIGN TEST ON AUTOREGRESSIVE DATA.
AD-629 272 FLD. 12/1

•STATISTICAL TESTS
DISTRIBUTION THEORY
SIGN TEST ON AUTOREGRESSIVE DATA.
AD-629 272 FLD. 12/1

OPTIMIZATION
USE OF THE CONCEPT OF A FUTURE OBSERVATION IN GOODNESS OFFIT PROBLEMS.
AD-629 270 FLD. 12/1

•STEAM TURBINES
BLEED SYSTEMS
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL STUDY OF AMODEL CONTROL BLEEDER STAGE WITH A ROTATING DIAPHRAGM.
AD-629 199 FLD. 21/5

•STEEL
FRACTURE(MECHANICS)
METALLURGICAL CHARACTERISTICS OF HIGH STRENGTH STRUCTURALMATERIALS.
AD-629 379 FLD. 11/6

HEAT TREATMENT
TRANSLATION OF RUSSIAN RESEARCH: INFLUENCE OF HEATTREATMENT ON THE PHYSICOMECHANICAL PROPERTIES OF STEELSOF THE AUSTENITE-MARTENSITE CLASS..
AD-629 293 FLD. 11/6

•STEREOCHEMISTRY
ACRYLIC RESINS
REPRINT: TACTICITY DETERMINATIONS ON ALLYL METHACRYLATEPOLYMERS.
AD-629 977 FLD. 11/9

CYCLOPROPANES
FACTORS INVOLVED IN THE STABILITY OF CYCLOPROPANES.
AD-629 080 FLD. 7/3

•STOCHASTIC PROCESSES
EPIDEMIOLOGY
REPRINT: ON THE GENERAL STOCHASTIC EPIDEMIC.
AD-629 899 FLD. 12/1

LINEAR PROGRAMMING
APPLICATION OF CHANCE-CONSTRAINED PROGRAMMING TOSOLUTION OF THE SO-CALLED 'SAVINGS AND LOAN ASSOCIATION'TYPE OF PROBLEM.
AD-629 050 FLD. 12/2

•STORAGE TANKS
BLAST
BLAST EFFECTS ON U. S. ARMY WATER-STORAGE CONTAINERS.
AD-629 396 FLD. 19/4

•STORAGE TUBES
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR TYPE FW-202 BARRIERGRID STORAGE TUBE.
AD-629 190 FLD. 9/1

•STRAIN(MECHANICS)
SEISMOGRAPHS
MULTICOMPONENT STRAIN SEISMOGRAPH.
AD-629 918 FLD. 8/11

SHAFTS
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF LOCAL STRAINDURING BENDING OF A HOLLOW SHAFT.
AD-629 249 FLD. 20/11

•STRUCTURAL GEOLOGY
CALIFORNIA
REPRINT: STRUCTURE OF THE CONTINENTAL MARGIN OFF CENTRALCALIFORNIA.
AD-629 949 FLD. 8/7

•STRUCTURAL PARTS
MACHINES

TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL INVESTIGATIONOF THE INFLUENCE OF LOAD ALTERNATION ON THE FATIGUE STRENGTHAND LONGEVITY OF COMPONENTS WITH AND WITHOUT STRESSCONCENTRATION. COMMUNICATION II.
AD-629 197 FLD. 20/11

•STRUCTURAL SHELLS
LOADING(MECHANICS)
SNAP-THROUGH AND POSTBUCKLING-EQUILIBRIUM BEHAVIOR OFCIRCULAR CYLINDRICAL SHELLS UNDER AXIAL LOAD.
AD-629 275 FLD. 20/11
ELASTIC-PLASTIC ANALYSIS OF THE COLLAPSE OF UNIFORMLYCOMPRESSED CIRCULAR CYLINDRICAL SHELLS.
AD-629 276 FLD. 20/11

MOTION
TRANSLATION OF RUSSIAN RESEARCH: OSCILLATIONS AND STABILITYOF A TRIPLE LAYER CYLINDRICAL SHELL WITH INCOMPRESSIBLEIDEAL LIQUID.
AD-629 297 FLD. 20/11

OSCILLATION
TRANSLATION OF RUSSIAN RESEARCH: APPLICATION OF THE METHODOF DYNAMIC STIFFNESS FOR CALCULATION OF THE FREQUENCY OFNATURAL OSCILLATIONS OF COMPOSITE SHELLS.
AD-629 159 FLD. 20/11

STRESSES
TRANSLATION OF RUSSIAN RESEARCH: STRESSED STATE AROUND ACIRCULAR HOLE IN A SHELL OF REVOLUTION WITH A SHALLOWMERIDIAN ARC.
AD-629 076 FLD. 20/11

•STYRENE PLASTICS
COPOLYMERIZATION
REPRINT: POLYSACCHARIDE GRAFT COPOLYMER PREPARED BYANIONIC COUPLING.
AD-629 179 FLD. 11/9

DECOMPOSITION
REPRINT: THERMAL DEPOLYMERIZATION OF POLYMETHYLMETHACRYLATE AND POLY-ALPHA-METHYLSTYRENE IN SOLUTIONIN VARIOUS SOLVENTS.
AD-629 969 FLD. 7/9

PREPARATION
REPRINT: COMPARISON OF CATALYTIC SYSTEMS FOR THEIONIC COPOLYMERIZATION OF STYRENE AND P-METHYLSTYRENE.
AD-629 991 FLD. 11/9

•STYRENES
COPOLYMERIZATION
REPRINT: COMPARISON OF CATALYTIC SYSTEMS FOR THEIONIC COPOLYMERIZATION OF STYRENE AND P-METHYLSTYRENE.
AD-629 991 FLD. 11/9

OXIDATION
REPRINT: ABSOLUTE RATE CONSTANTS FOR HYDROCARBONAUTOXIDATION. DEUTERO STYRENES AND RING-SUBSTITUTEDSTYRENES.
AD-629 969 FLD. 7/9

•SUBJECT INDEXING
CURVE FITTING
CHARACTERISTICS OF ASSIGNMENT OF UNITERMS FOR COORDINATEINDEXING OVER A SHORT PERIOD OF TIME.
AD-629 027 FLD. 9/2

•SUBMARINE HULLS
METAL PLATES
METALLURGICAL CHARACTERISTICS OF HIGH STRENGTH STRUCTURALMATERIALS.
AD-629 379 FLD. 11/6

PLASTIC COATINGS
PROTECTIVE COATINGS FOR DEEP SUBMERGENCE VESSELS.
AD-629 896 FLD. 11/3

•SUBMARINES
LIGHTING EQUIPMENT
LIGHTING SURVEY OF U.S.S. DOGFISH (SS350).
AD-629 289 FLD. 13/10

•SUBMINIATURE ELECTRONIC EQUIPMENT
TIME-INTERVAL COUNTERS
MICROELECTRONIC FREQUENCY AND TIME STANDARD.
AD-629 916 FLD. 14/2

•SULFATES
DISSOCIATION
REPRINT: EFFECT OF PRESSURE ON THE DISSOCIATION OFMANGANESE SULFATE ION PAIRS IN WATER.
AD-629 989 FLD. 7/9

•SULFOXIDES
OXIDATION-REDUCTION REACTIONS
DEOXYGENATION REACTIONS OF AMINE OXIDES AND SULFOXIDES.
AD-629 919 FLD. 7/3

PENETRATION
REPRINT: PENETRATION OF GUINEA PIG AND RABBIT SKIN BYDIMETHYL SULFOXIDE SOLUTIONS OF A QUATERNARY OXIME.
AD-629 939 FLD. 6/19

•SULFUR
INORGANIC POLYMERS
VISCOELASTIC RELAXATION MECHANISM OF INORGANIC POLYMERS:SIMULTANEOUS MULTIPLE MECHANISM IN LANTHANUM-DOPEDSODIUM POLYPHOSPHATE AND IN ARSENIC-DOPED SULFUR POLYMER.
AD-629 329 FLD. 11/9

•SUN
RADIO ASTRONOMY
REPRINT: 2,700 MC./S. SOLAR PATROL AT THE DOMINION RADIOASTROPHYSICAL OBSERVATORY, PENTICTON, B. C.
AD-629 958 FLD. 3/2

SCIENTIFIC RESEARCH
BASIC SOLAR RESEARCH.
AD-629 026 FLD. 3/2

•SUNSPOTS
ASTRONOMICAL DATA
CLASSIFICATION OF SOLAR PROMINENCES FOR SUNSPOT CYCLENO. 19 - 1962.
AD-629 381 FLD. 3/2

•SUPERAERODYNAMICS
SCIENTIFIC RESEARCH
PLASMA FLUID MECHANICS AND RAREFIED GAS FLOWS: FINALSUMMARY REPT.
AD-629 980 FLD. 20/9

•SUPERSONIC FLOW
COMBUSTION
TRANSLATION OF RUSSIAN RESEARCH: FLOW OF A NON-ADIABATICSUPERSONIC FLOW OF AN IDEAL GAS AROUND A FLAT PLATE.
AD-629 061 FLD. 21/2

FLUTTER
THEORETICAL CONSIDERATIONS OF PANEL FLUTTER AT HIGH SUPERSONIC MACH NUMBERS.
AD-629 999 FLD. 20/11

PRESSURE GAGES
TRANSLATION OF A RUSSIAN PATENT: TOTAL PRESSURE PROBEFOR A SUPERSONIC GAS FLOW WITH A SLIGHTLY NONUNIFORMVELOCITY FIELD.
AD-629 069 FLD. 14/2

TURBULENCE
TRANSLATION OF RUSSIAN RESEARCH: PERTURBATIONS OFSUPERSONIC FLOW CAUSED BY DISCRETE OR CONTINUOUSLY DISTRIBUTEDHEAT AND MASS FLOWS.
AD-629 293 FLD. 20/4

•SUPPRESSORS
FREQUENCY
REPRINT: SECONDARY WAVE ELIMINATION IN THICKNESS-SHEARVIBRATION QUARTZ PLATE FRO FREQUENCY 9-100 MHZ: TESTIN GERMAN.
AD-629 949 FLD. 9/5

•SURFACE PROPERTIES
TRANSISTORS
EFFECT OF TRANSISTOR DESIGN PARAMETERS ON RADIATIONRESPONSE (SURFACE EFFECTS).
AD-629 933 FLD. 9/1

•SURFACE TEMPERATURES
THERMOCOUPLE PYROMETERS
PROBE FOR THE MEASUREMENT OF HIGH SURFACE TEMPERATURES.
AD-629 888 FLD. 14/2

•SURFACEACTIVE SUBSTANCES
WATER WAVES
DAMPING OF CAPILLARY WAVES AT THE AIR/WATER INTERFACE BYNATURALLY OCCURRING SURFACE-ACTIVE MATERIAL.
AD-629 933 FLD. 20/4

•SURFACE-ACTIVE SUBSTANCES
FOAMS
PRIMARY ADSORPTION DURING SURFACTANT FOAM FORMATION.
AD-629 349 FLD. 11/11

•SURGICAL TECHNIQUES
HYPOTHERMIA
REPRINT: EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OFETHANOL FROM ARTERIAL BLOOD.
AD-629 521 FLD. 6/5

•SURVIVAL
AIR FORCE EQUIPMENT
MINUTES OF THE PERSONAL EQUIPMENT ADVISORY GROUPMEETING, OCT., 1969.
AD-629 401 FLD. 6/17

•SYMPOSIA
SOCIAL COMMUNICATION
INFORMAL AND CREATIVE METHOD FOR CONDUCTING CONFERENCES:PRINCIPLES FOR ACHIEVEMENT.
AD-629 239 FLD. 5/11

•SYNTAX
PROGRAMMING LANGUAGES
ANALYSIS OF SYNTAX BY A PRODUCTION COMPUTER LANGUAGE.
AD-629 965 FLD. 9/2

•SYNTHESIS(CHEMISTRY)
PLASMA JETS
PLASMA JETS FOR CHEMICAL SYNTHESIS.
AD-629 991 FLD. 20/9

•SYSTEMS ENGINEERING
MANAGEMENT PLANNING
SYSTEM VIEW AND THE DISENCHANTED EXECUTIVE.
AD-629 002 FLD. 5/1

•S-HETEROCYCLIC COMPOUNDS
FREE RADICALS
REPRINT: ION RADICALS. VII. THE REACTIONS OF THIANTHRENEOXIDE IN HYDROCHLORIC ACID.

AD-629 990 FLD. 7/3
REPRINT: ION RADICALS. PHENOXATHIIN AND PHENOXATHIIN5-OXIDE IN SULFURIC ACID.
AD-629 992 FLD. 7/3
REPRINT: ION RADICALS. PHENOTHIAZINE, PHENOTHIAZINE5-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS.
AD-629 993 FLD. 7/3

•S-MATRIX
FIELD THEORY
REPRINT: PROBLEM OF CAUSALITY IN S-MATRIX THEORY.
AD-629 997 FLD. 20/10

•TABLES
QUALITY CONTROL
TAMPER: TABLES FOR APPROXIMATION OF MID-POINTS FOREXPONENTIAL REGRESSION.
AD-629 339 FLD. 12/1

•TAKEOFF
WATER-BASED PLANES
EFFECT OF WAVES, LOADING, AND CONFIGURATION ON THE TAKE-OFFPERFORMANCE OF WATER-BASED AIRCRAFT.
AD-629 368 FLD. 1/2

•TANKS(COMBAT VEHICLE)
HUMAN ENGINEERING
CROSS-COUNTRY SPEED AND DRIVER VIBRATIONAL ENVIRONMENTOF THE M60 MAIN BATTLE TANK.
AD-629 117 FLD. 5/5

•TANTALUM
CRYSTAL LATTICE DEFECTS
DISLOCATION DYNAMICS IN METALS AND THE INFLUENCE OF DISLOCATION DISTRIBUTION ON LOW TEMPERATURE ELECTRICAL TRANSPORT PROPERTIES.
AD-629 023 FLD. 20/2

•TANTALUM CAPACITORS
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITYOF SOLID ELECTROLYTE TANTALUM CAPACITORS.
AD-629 984 FLD. 9/1

•TANTALUM COMPOUNDS
NITRIDES
REPRINT: ANALYSIS OF THIN FILMS OF TANTALUM REACTIVELYSPUTTERED IN NITROGEN ATMOSPHERE.
AD-629 989 FLD. 7/2

•TARGET RECOGNITION
TELEVISION DISPLAY SYSTEMS
TARGET DETECTION USING BLACK-AND-WHITE TELEVISION.DEGRADED RESOLUTION AND TARGET-DETECTION PROBABILITY.
AD-629 230 FLD. 17/8
TARGET DETECTION USING BLACK-AND-WHITE TELEVISION. THEEFFECTS OF RESOLUTION DEGRADATION ON TARGET DETECTION.
AD-629 231 FLD. 17/8

•TEETH
DISEASES
REPRINT: DEFINITION AND OBJECTIVES OF THE CONFERENCEON PHOSPHATES AND DENTAL CARIES.
AD-629 926 FLD. 6/5

•TELEMETERING ANTENNAS
SATELLITE ANTENNAS
TELEMETRY ANTENNA FOR LINCOLN EXPERIMENTAL SATELLITESLES-1 AND LES-2.
AD-629 936 FLD. 9/6

•TELEVISION DISPLAY SYSTEMS
RESOLUTION
TARGET DETECTION USING BLACK-AND-WHITE TELEVISION.DEGRADED RESOLUTION AND TARGET-DETECTION PROBABILITY.
AD-629 230 FLD. 17/8
TARGET DETECTION USING BLACK-AND-WHITE TELEVISION. THEEFFECTS OF RESOLUTION DEGRADATION ON TARGET DETECTION.
AD-629 231 FLD. 17/8

•TELLURIC CURRENTS
MAGNETOHYDRODYNAMICS
STUDIES OF THE DYNAMO ACTION OF THE LIQUID CORE OF THE EARTH.
AD-629 957 FLD. 8/14

•TEMPERATURE CONTROL
PROTECTIVE CLOTHING
STUDY AND DEVELOPMENT OF MATERIALS AND TECHNIQUES FORPASSIVE THERMAL CONTROL OF FLEXIBLE EXTRAVEHICULAR SPACEGARMENTS.
AD-629 886 FLD. 6/11

SPACECRAFT
EFFECTS OF EXTREME ULTRAVIOLET RADIATION ON THEREFLECTANCE OF THERMAL CONTROL SURFACE COATINGS.
AD-629 992 FLD. 22/2

•TERRESTRIAL MAGNETISM
MAGNETOHYDRODYNAMICS
STUDIES OF THE DYNAMO ACTION OF THE LIQUID CORE OF THE EARTH.
AD-629 957 FLD. 8/14

•TEST METHODS
FAILURE(ELECTRONICS)
ELECTRICAL ENGINEERING: INVESTIGATION OF FAULT DIAGNOSIS BYTRANSFER FUNCTION TECHNIQUES.
AD-629 987 FLD. 9/3

REFRACTORY METALS
EVALUATION TEST METHODS FOR REFRACTORY METAL SHEETMATERIALS.
AD-629 606 FLD. 14/2

VISCOSITY
REPRINT: VISCOSITY MEASUREMENTS OF IONIC MELTS ATTEMPERATURES TO 1100C.
AD-629 936 FLD. 7/4

•TEXTILES
STRESSES
BIAXIAL STRESS-STRAIN BEHAVIOR OF FABRICS.
AD-629 295 FLD. 11/9

•THERMAL DIFFUSION
PLASMA MEDIUM
ELECTRON THERMAL DIFFUSIVITY IN RARE-GAS AFTERGLOWPLASMAS.
AD-629 082 FLD. 20/9

•THERMAL INSULATION
FUEL TANKS
THERMAL PROTECTION FOR LIQUID-HYDROGEN FUEL TANKS INHIGH-SPEED, LONG-RANGE AIRCRAFT.
AD-629 407 FLD. 21/4

•THERMAL JOINING
REFRACTORY METALS
TRANSLATION OF RUSSIAN RESEARCH: RECRYSTALLIZATION OFHIGH-MELTING METALS IN WELDING AND SOLDERING.
AD-629 909 FLD. 13/8

•THERMIONIC CONVERTERS
REACTOR SYSTEM COMPONENTS
EFFECT OF SIMULATED FISSION PRODUCTS IN THE INTER-ELECTRODESPACING OF A THERMIONIC DIODE.
AD-629 986 FLD. 18/10

•THERMOCOUPLE PYROMETERS
SURFACE TEMPERATURES
PROBE FOR THE MEASUREMENT OF HIGH SURFACE TEMPERATURES.
AD-629 808 FLD. 14/2

•THERMODYNAMICS
BERYLLIUM COMPOUNDS
REPRINT: HEAT CAPACITY AND THERMODYNAMIC PROPERTIESOF BERYLLIUM ALUMINATE (CHRYSOBERYL), BEO-A1203, FROM16 TO 980K.
AD-629 096 FLD. 20/13

REVIEWS
THERMODYNAMICS OF THE LIQUID-LIQUID CRITICAL MIXINGREGION.
AD-629 959 FLD. 20/13

ROCKET PROPELLANTS
ROCKET ENGINE EXHAUST PRODUCTS: THERMODYNAMICPROPERTIES.
AD-629 998 FLD. 21/9

SOLAR ATMOSPHERE
REPRINT: THERMODYNAMICS OF A SOLAR COMPOSITIONGASEOUS MIXTURE.
AD-629 939 FLD. 3/2

•THERMOELECTRICITY
BUOYS
1) WATT THERMOELECTRIC POWER SYSTEM FOR BUOYAPPLICATIONS.
AD-629 978 FLD. 10/2

COOLING + VENTILATION EQUIPMENT
TRANSLATION OF RUSSIAN RESEARCH: THERMOELECTRICCOOLING AND ITS PRACTICAL APPLICATION.
AD-629 292 FLD. 13/1

•THIAZOLES
SYNTHESIS(CHEMISTRY)
REPRINT: 2,3-NAPHTHOQUINONOID HETEROCYCLES. II. A HIGHLYSTABILIZED THIADIAZOLE ANALOG OF ANTHRACENE.
AD-629 636 FLD. 7/3

•THORIUM COMPOUNDS
DIOXIDES
PRODUCTION OF VISIBLE LIGHT BY THE THORIA-CERIA MANTLE;PHYSICAL CHARACTERISTICS AND A PROPOSED THEORY OF THEOCCURRING MECHANISMS AND PROCESSES.
AD-629 008 FLD. 7/4

•THROMBIN
BLOOD PLASMA
REPRINT: INACTIVATION OF ANTITHROMBIN BY ETHER: EVIDENCEAGAINST THE EXISTENCE OF ANTITHROMBIN IV.
AD-629 920 FLD. 6/16

•TICKS
ADAPTATION(PHYSIOLOGY)
TRANSLATION OF RUSSIAN RESEARCH: REACTION OFORNITHODOROS PAPILLIPES BIR. TO SOME PHYSICAL FACTORSOF THE ENVIRONMENT.
AD-629 640 FLD. 6/3
TRANSLATION OF RUSSIAN RESEARCH: EFFECT OF REDUCEDATMOSPHERIC PRESSURE AND SEVERAL GASES ON THE TICKSORNITHODOROS PAPILLIPES BIR.
AD-629 653 FLD. 6/3

BODY TEMPERATURE
TRANSLATION OF RUSSIAN RESEARCH: TEMPERATURECHANGES IN THE BODY OF ORNITHODOROS PAPILLIPES DURINGBLOODSUCKING.
AD-629 644 FLD. 6/3

MORPHOLOGY(BIOLOGY)
TRANSLATION OF RUSSIAN RESEARCH: FUNCTIONAL MORPHOLOGYOF ORNITHODOROS TICKS.
AD-629 627 FLD. 6/3

SPIROCHAETA
TRANSLATION OF RUSSIAN RESEARCH:

CONTRIBUTION TO THEBIOLOGY OF THE TICK ORNITHODOROS PAPILLIPES.
AD-625 625 FLD. 6/3
TRANSLATION OF RUSSIAN RESEARCH: EXPERIMENTAL ANALYSISOF THE IMPORTANCE OF THE DIFFERENT PHASES IN THEMETAMORPHOSIS OF ORNITHODOROS PAPILLIPES IN THETRANSMISSION OF THE SPIROCHAETES OF TICK-BORNERELAPSING FEVER.
AD-625 633 FLD. 6/3

•TIME
STANDARDS
REPRINT: CESIUM-BEAM FREQUENCY STANDARD FOR DEFININGAN ATOMIC SECOND AND AN ATOMIC TIME SCALE.
AD-624 976 FLD. 14/2

•TIN COMPOUNDS
METALORGANIC COMPOUNDS
REPRINT: SYNTHESIS AND PROPERTIES OF ORGANIC TINHYDROPEROXIDES.
AD-625 649 FLD. 7/3

•TIRES
PERFORMANCE(ENGINEERING)
EFFECTS OF WET SURFACE SOIL CONDITIONS ON THE PERFORMANCEOF A SINGLE PNEUMATIC-TIRED WHEEL.
AD-625 390 FLD. 13/6

•TISSUE EXTRACTS
CONDUCTIVITY
THERMAL AND ELECTRICAL CONDUCTIVITIES OF BIOLOGICAL FLUIDSAND TISSUES.
AD-624 897 FLD. 6/3

•TITANIUM
LUBRICATION
TRANSLATION OF A RUSSIAN PATENT: METHOD OF OBTAININGLUBRICANT FOR TITANIUM PARTS.
AD-625 160 FLD. 11/8

•TITANIUM ALLOYS
FRACTURE(MECHANICS)
METALLURGICAL CHARACTERISTICS OF HIGH STRENGTH STRUCTURALMATERIALS.
AD-625 374 FLD. 11/6
STRESS CRACKING PROPERTIES OF TI-721 ALLOY TITANIUMLARGE SCALE BUTT WELDED AND BASE PLATE SPECIMENS INAIR AND SEA WATER.
AD-625 532 FLD. 11/6

WELDING
TRANSLATION OF RUSSIAN PATENT. METHOD OF WELDING BY THEFUSING OF BETA-TITANIUM ALLOYS.
AD-625 069 FLD. 13/8

•TOPOLOGY
NETWORKS
ELEMENTARY COMPLETE TREE TRANSFORMATION.
AD-625 201 FLD. 9/1

•TORPEDOES
RECOVERY
HIGH-PRESSURE GAS FROM LITHIUM HYDRIDE AND SEA WATER FORUSE IN TORPEDO RECOVERY SYSTEMS.
AD-625 513 FLD. 19/8

•TRACHEA
PROBES
NEW APPROACH TO STUDIES OF MUCUS FLOW AND CILIARYACTIVITY.
AD-625 916 FLD. 6/12

•TRACKING
LEARNING
REPRINT: PROBABILITY LEARNING IN STEP-INPUT TRACKING.
AD-625 103 FLD. 5/10

•TRAFFICABILITY
TEST METHODS
AERIAL CONE PENETROMETER: DEMONSTRATION FOR DETERMININGTRAFFICABILITY OF SOILS.
AD-625 601 FLD. 14/2

•TRAINING DEVICES
HUMAN ENGINEERING
RESEARCH ON CONSIDERATION OF TRAINING FUNCTIONS DURINGDESIGN OF OPERATIONAL EQUIPMENT.
AD-625 129 FLD. 5/9

•TRANSDUCERS
CALIBRATION
STANDARDIZED TRANSDUCER CALIBRATION SYSTEM FOR NAVALSHIPYARD TRANSDUCER REPAIR FACILITIES.
AD-624 926 FLD. 14/2

PATENTS
TRANSLATION OF A RUSSIAN PATENT: TRANSDUCER OFSPECTROMETER OF ELECTRONIC PARAMAGNETIC RESONANCE.
AD-625 009 FLD. 20/6

•TRANSFORMATIONAL GRAMMARS
INFORMATION RETRIEVAL
TRANSFORMATION OF SENTENCES FOR INFORMATION RETRIEVAL.
AD-624 890 FLD. 5/2

•TRANSFORMATIONS(MATHEMATICS)
TOPOLOGY
ELEMENTARY COMPLETE TREE TRANSFORMATION.
AD-625 201 FLD. 9/1

•TRANSISTOR AMPLIFIERS
L BAND
UHF SMALL SIGNAL TRANSISTOR.
AD-625 933 FLD. 9/1

•TRANSISTORS
MANUFACTURING METHODS
PRODUCTION ENGINEERING MEASURE FOR SILICON OVERLAYTRANSISTORS.
AD-625 317 FLD. 9/1
TRANSISTOR, VHF, SILICON, POWER, LINEAR, 30-MC, 100WATTS PEP.
AD-625 328 FLD. 9/1

RADIATION DAMAGE
EFFECT OF TRANSISTOR DESIGN PARAMETERS ON RADIATIONRESPONSE (SURFACE EFFECTS).
AD-625 539 FLD. 9/1

ULTRAHIGH FREQUENCY
UHF SMALL SIGNAL TRANSISTOR.
AD-625 933 FLD. 9/1

•TRANSITION METALS
PHASE STUDIES
TERNARY INTERSTITIAL COMPOUNDS OF BORON AND NITROGEN WITHTRANSITION AND POST-TRANSITION METALS.
AD-625 028 FLD. 11/6

•TRANSPORT PROPERTIES
SUPERSONIC FLOW
TRANSLATION OF RUSSIAN RESEARCH: PERTURBATIONS OFSUPERSONIC FLOW CAUSED BY DISCRETE OR CONTINUOUSLY DISTRIBUTEDHEAT AND MASS FLOWS.
AD-625 249 FLD. 20/4

•TRICHINELLA
ANTIGENS + ANTIBODIES
HOST PRECIPITIN ANTIBODY PRODUCTION IN RELATION TODIFFERENTIATION AND GROWTH OF PARASITIC ROUNDWORMS.
AD-625 029 FLD. 6/3

•TROPICAL CYCLONES
OZONE
REPRINT: OZONE AND TEMPERATURE STRUCTURE IN A HURRICANE.
AD-625 123 FLD. 4/2

•TROPICAL REGIONS
GEOGRAPHY
INVENTORY OF GEOGRAPHIC RESEARCH OF THE HUMID TROPICENVIRONMENT. VOLUME I. KWIC INDEX. HUMID TROPICENVIRONMENTAL LITERATURE.
AD-625 926 FLD. 8/6

SCIENTIFIC RESEARCH
HUMID TROPICS RESEARCH: DIRECTORY OF INSTITUTIONS FORTHE INTERNATIONAL GEOGRAPHICAL UNION.
AD-625 927 FLD. 8/6

•TUNGSTEN ALLOYS
ARSENIC ALLOYS
REPRINT: THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM.
AD-624 967 FLD. 11/6

•TURBINE BLADES
THERMAL PROPERTIES
TRANSLATION OF RUSSIAN RESEARCH: THERMAL RESISTANCEOF TAIL CONNECTIONS OF TURBINE BLADES.
AD-625 242 FLD. 21/5

•TURBINE PARTS
CONVECTION(HEAT TRANSFER)
TRANSLATION OF UKRANIAN RESEARCH: FREE HEAT CONVECTIONIN TURBINE CLEARANCE.
AD-625 269 FLD. 10/1

•TURBINES
HYDRODYNAMICS
HYDRODYNAMICS OF TURBOMACHINES.
AD-625 918 FLD. 10/1

•TURBOPUMPS
HYDRODYNAMICS
HYDRODYNAMICS OF TURBOMACHINES.
AD-625 918 FLD. 10/1

•TURBULENCE
FLUID FLOW
TURBULENT FLOW IN ROUGH PIPES.
AD-625 037 FLD. 20/4

FLUID MECHANICS
TRANSLATION OF RUSSIAN RESEARCH: AERODYNAMICS ANDHEAT TRANSFER OF A FLAT TURBULENT STREAM FLOWING ALONG AFLAT SURFACE.
AD-625 056 FLD. 20/4

•ULTRASONIC RADIATION
DRILLING
TRANSLATION OF RUSSIAN RESEARCH: ULTRASONIC MACHINE TOOL.
AD-625 167 FLD. 13/9

NON-DESTRUCTIVE TESTING
TRANSLATION OF RUSSIAN RESEARCH: ULTRASONICDEFECTOSCOPY OF TUBES.
AD-625 229 FLD. 13/8

•ULTRAVIOLET SPECTROSCOPY
CHROMOSPHERE
REPRINT: ROCKET SPECTRA OF THE CHROMOSPHERE.
AD-625 134 FLD. 3/2

NITROGEN COMPOUNDS
HIGH RESOLUTION ECHELLE VACUUM SPECTROGRAPH APPLIED TOMEASUREMENT OF MOLECULAR CONSTANTS OF THE 1Σ() STATEOF NO().
AD-625 337 FLD. 20/6

ROCK(GEOLOGY)
RESPONSE OF SELECTED ROCK SPECIMENS TO VACUUM ULTRAVIOLET LIGHT.
AD-625 393 FLD. 8/7

SOLAR RADIATION
REPRINT: ABSOLUTE INTENSITY MEASUREMENTS IN THE EXTREMEULTRAVIOLET SPECTRUM OF SOLAR RADIATION.

AD-625 124 FLD. 20/6

SOLAR SPECTRUM
REPRINT: SOLAR XUV SPECTRUM OF MARCH, 1964.
AD-625 131 FLD. 3/2

•UNDERGROUND STRUCTURES
SEISMOLOGICAL STATIONS
EVALUATION OF SEISMOMETERS LOCATED IN DEEP WELLS.
AD-625 514 FLD. 8/11
EVALUATION OF SEISMOMETERS LOCATED IN DEEP WELLS.
AD-625 515 FLD. 8/11

•UNDERWATER PROPULSION
OCEAN BOTTOM
LOCOMOTION OF OCEAN BOTTOM VEHICLE BY SHIFTING BALLAST.
AD-625 321 FLD. 13/10

•UPPER ATMOSPHERE
GAS IONIZATION
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERIC GASES.
AD-625 480 FLD. 4/1

STABILITY
PHOTOCHEMICAL DESTABILIZATION OF GRAVITY WAVES NEAR THEMESOPAUSE.
AD-625 011 FLD. 4/1

•URBAN PLANNING
ECONOMICS
ECONOMIC FEASIBILITY OF DECENTRALIZED METROPOLITANREGIONS.
AD-625 172 FLD. 15/3

•VACCINES
EFFECTIVENESS
TRANSLATION OF RUSSIAN RESEARCH: COMPATIBILITY OF ANTHRAXSTI VACCINE IN ASSOCIATION WITH PLAGUE TULAREMIA ANDBRUCELLOSIS VACCINES.
AD-625 611 FLD. 6/13
TRANSLATION OF RUSSIAN RESEARCH: STUDY OF IMMUNOGENESISIN GUINEA PIGS VACCINATED WITH BRUCELLOSIS AND ANTHRAXVACCINE.
AD-625 651 FLD. 6/13

•VACUUM APPARATUS
LABORATORY EQUIPMENT
REPRINT: AN ATTEMPT TO REDUCE THE GAS LOAD IN AN ULTRAHIGHVACUUM CHAMBER.
AD-625 132 FLD. 14/2

•VALUE ENGINEERING
AMMUNITION
DESIGN OF AMMUNITION: VALUE ENGINEERING RESPONSIBILITYOF THE DESIGNER.
AD-625 659 FLD. 19/1

•VANADIUM COMPOUNDS
FLUORIDES
MAGNETIC ORDERING IN VF2.
AD-625 211 FLD. 7/4

•VAPOR PLATING
FERROMAGNETIC MATERIALS
TRANSLATION OF RUSSIAN RESEARCH: DEVICE FORSPRAYING FERROMAGNETIC FILMS ON A SUBSTRATE IN A VACUUM.
AD-625 285 FLD. 13/9

•VAPOR PRESSURE
ADSORPTION
REPRINT: FINDING HETEROGENEOUS ENERGY DISTRIBUTIONSFROM PHYSICAL ADSORPTION ISOTHERMS.
AD-624 972 FLD. 7/4
REPRINT: PHYSICAL ADSORPTION ISOTHERMS ON HETEROGENEOUSSURFACES AT VERY LOW PRESSURES.
AD-624 973 FLD. 7/4

•VAPORS
ELASTICITY
TRANSLATION OF RUSSIAN RESEARCH: DETERMINING THEELASTICITY OF SATURATED VAPORS OF LUBRICATING MATERIALS.
AD-625 155 FLD. 11/8

•VARACTOR DIODES
MICROWAVE OSCILLATORS
REPRINT: MICROWAVE GENERATION FROM AVALANCHINGVARACTOR DIODES.
AD-624 996 FLD. 9/5

•VEGETABLES
IRRADIATED FOODS
STUDY OF THE RADIATION-INDUCED SOFTENING OF PLANT TISSUES.
AD-625 483 FLD. 6/8

•VERBAL BEHAVIOR
ATTITUDES
EFFECT OF ROLE-REVERSAL DURING THE DISCUSSION OFOPPOSING VIEWPOINTS.
AD-624 919 FLD. 5/10

•VERTICAL TAKE-OFF PLANES
HANDLING
ANALYTICAL STUDY OF V/STOL HANDLING QUALITIES IN HOVER ANDTRANSITION.
AD-625 599 FLD. 1/2

•VERTIGO
VISUAL PERCEPTION
REPRINT: PERCEPTUAL VERTIGO: A DIMENSIONAL STUDY.
AD-625 525 FLD. 6/19

•VESTIBULAR APPARATUS
ACCELERATION
REPRINT: THEORETICAL ASPECTS OF THE ROLE OF ANGULARACCELERATION IN VESTIBULAR STIMULATION.
AD-625 934 FLD. 6/19

WEIGHTLESSNESS
OTOLITH ORGAN ACTIVITY WITHIN EARTH STANDARD,ONE-HALF STANDARD, AND ZERO GRAVITY ENVIRONMENTS.
AD-625 323 FLD. 6/19

•VIBRATION
STRUCTURAL SHELLS
TRANSLATION OF RUSSIAN RESEARCH: EQUATIONS OF TRANSVERSEVIBRATIONS OF FLUID-FILLED SHELLS.
AD-625 052 FLD. 20/11

•VIRUS DISEASES
INDEXES
INDEX CATALOGUE TO RUSSIAN, CENTRAL AND EASTERN EUROPEAN,AND CHINESE LITERATURE IN MEDICAL ENTOMOLOGY. VOLUME 9.VIRAL DISEASES.
AD-625 100 FLD. 6/3

USSR
TRANSLATION OF RUSSIAN RESEARCH: OMSK HEMORRHAGICFEVER INCIDENCE IN MAN AND MUSKRATS IN WINTER.
AD-625 697 FLD. 6/13

•VISCOELASTICITY
CYLINDRICAL BODIES
FINITE DEFORMATIONS UNDER PRESSURIZATION IN AN INFINITELYLONG, THICK-WALLED, NONLINEARLY VISCOELASTIC CYLINDERIDEALLY BONDED TO A THIN ELASTIC CASE.
AD-625 219 FLD. 20/11

RELAXATION TIME
VISCOELASTIC RELAXATION MECHANISM OF INORGANIC POLYMERS:SIMULTANEOUS MULTIPLE MECHANISM IN LANTHANUM-DOPEDSODIUM POLYPHOSPHATE AND IN ARSENIC-DOPED SULFUR POLYMER.
AD-625 329 FLD. 11/9
VISCOELASTIC RELAXATION MECHANISMS OF INORGANICPOLYMERS: COUNTERION EFFECTS IN BULK PHOSPHATEPOLYELECTROLYTES.
AD-625 331 FLD. 11/9

•VISCOSITY
SALTS
REPRINT: VISCOSITY MEASUREMENTS OF IONIC MELTS ATTEMPERATURES TO 1100C.
AD-625 936 FLD. 7/4

•VISION
AGING(PHYSIOLOGY)
REFRACTIVE CHARACTERISTICS AND INTRAOCULAR TENSIONS OFCOLONY CHIMPANZEES.
AD-625 333 FLD. 6/3

PSYCHOPHYSIOLOGY
BINOCULAR RIVALRY: INDIVIDUAL DIFFERENCES IN ITSFUNCTIONAL RELATIONSHIP TO LUMINANCE AND INSTRUCTIONALCONDITIONS.
AD-624 900 FLD. 5/10

SENSORY DEPRIVATION
REPRINT: AUDITORY SENSITIVITY AFTER PROLONGED VISUALDEPRIVATION.
AD-625 528 FLD. 6/16

•VISUAL PERCEPTION
POSTURE
VISUAL LOCALIZATION OF THE HORIZONTAL AS A FUNCTION OF BODYTILT UP TO 90 DEGREES FROM GRAVITATIONAL VERTICAL.
AD-625 266 FLD. 6/19

•VOCABULARY
LIBRARIES
LIST OF ACRONYMS AND ABBREVIATIONS USED IN THE MCDONNELLAIRCRAFT TECHNICAL LIBRARY.
AD-625 208 FLD. 5/2

•VOICE COMMUNICATION SYSTEMS
HARMONIC ANALYZERS
TRANSLATION OF RUSSIAN PATENT: DEVICE FOR THE ANALYSIS OFTHE INSTANTANEOUS SPECTRUM OF A VOICE SIGNAL IN HARMONICDECODERS.
AD-625 197 FLD. 20/1

SPEECH
COMMUNICATION BY VOICE.
AD-624 861 FLD. 17/2.1

•VORTEX GENERATORS
AERODYNAMICS
AERODYNAMIC PERFORMANCE OF REVERSED FLOW VORTEXCHAMBERS.
AD-625 909 FLD. 14/2

TRANSPORT PROPERTIES
TRANSLATION OF RUSSIAN RESEARCH: HYDRAULIC RESISTANCE ANDHEAT AND MASS TRANSFER IN A VORTICAL FLOW.
AD-625 289 FLD. 20/9

•WAKE
MATHEMATICAL ANALYSIS
WAKE ANALYSIS OF SHIP MODELS: SINGLE-SCREW MERCHANTTYPE.
AD-625 327 FLD. 13/10

•WATER
CARBON
REPRINT: SCATTERING PROPERTIES OF CONCENTRIC SOOT-WATERSPHERES FOR VISIBLE AND INFRARED LIGHT.
AD-624 952 FLD. 20/6

PHASE STUDIES
SEPARATION OF HYDRO-AZEOTROPES: TRANSLATION OF RUSSIANDOCUMENT.
AD-625 430 FLD. 7/4
TRANSLATIONS FROM THE RUSSIAN: LIQUID-VAPOR PHASEEQUILIBRIUM OF

ALCOHOL - WATER MIXTURES IN THE PRESENCEOF CERTAIN SALTS, AT ATMOSPHERIC PRESSURE.
AD-629 931 FLD. 7/4

VAPORIZATION
REPRINT: FORCED VAPORIZATION OF WATER.
AD-629 363 FLD. 20/13

•WATER SUPPLIES
DAMS
INDEPENDENCE OF YEARLY WATER INPUTS IN DAMS.
AD-629 898 FLD. 8/8

•WATER TANKS
BLAST
BLAST EFFECTS ON U. S. ARMY WATER-STORAGE CONTAINERS.
AD-629 396 FLD. 19/4

•WATER VAPOR
ABSORPTION SPECTRUM
EMPIRICAL INFRARED ABSORPTION COEFFICIENTS OF H2O FROM300K TO 3000K.
AD-629 982 FLD. 21/2

•WATER WAVES
DAMPING
DAMPING OF CAPILLARY WAVES AT THE AIR/WATER INTERFACE BYNATURALLY OCCURRING SURFACE-ACTIVE MATERIAL.
AD-629 933 FLD. 20/4

•WATER-BASED PLANES
TAKE-OFF
EFFECT OF WAVES, LOADING, AND CONFIGURATION ON THE TAKE-OFFPERFORMANCE OF WATER-BASED AIRCRAFT.
AD-629 368 FLD. 1/2

•WAVE FUNCTIONS
ACOUSTICS
REPRINT: THE SCATTERING OF PLANE WAVES FROM PERIODICSURFACES.
AD-629 986 FLD. 20/1

INTEGRAL EQUATIONS
METHOD OF SOLVING THE INTEGRAL EQUATIONS FOR THE VERTICALPROPAGATION OF TIME-HARMONIC ELECTROMAGNETIC PLANEWAVES IN ANISOTROPIC VERTICALLY-HOMOGENEOUS MEDIA.
AD-629 609 FLD. 20/14

•WAVE TRANSMISSION
PLASMA MEDIUM
REPRINT: ON TRANSIENT WAVE PROPAGATION IN A PLASMA.
AD-629 139 FLD. 20/14

•WAVEGUIDES
ELECTROMAGNETIC PROPERTIES
REPRINT: PROPAGATION OF PULSES IN DISPERSIVE MEDIA.
AD-629 139 FLD. 20/14

MEASURING DEVICE(ELECTRICAL + ELECTRO
MEASUREMENT TECHNIQUES FOR OVERSIZED WAVEGUIDE.
AD-629 492 FLD. 9/1

•WEAPON SYSTEMS
TRAINING DEVICES
RESEARCH ON CONSIDERATION OF TRAINING FUNCTIONS DURINGDESIGN OF OPERATIONAL EQUIPMENT.
AD-629 129 FLD. 5/9

•WEAPONS
UNITED STATES
SURVEY OF WEAPONS AND HAZARDS WHICH MAY FACE THEUNITED STATES PEOPLE IN WARTIME.
AD-629 251 FLD. 15/3

•WEAR RESISTANCE

LUBRICANT ADDITIVES
TRANSLATION OF RUSSIAN PATENT. ANTIWEAR ADDITIVE FORLUBRICATING OILS.
AD-629 053 FLD. 11/8

•WEATHER FORECASTING
MATHEMATICAL MODELS
INITIALIZATION OF PRIMITIVE-EQUATION MODELS FOR NUMERICALWEATHER PREDICTION.
AD-629 348 FLD. 4/2

MILITARY REQUIREMENTS
TRANSLATION OF RUSSIAN RESEARCH: WAR AND WEATHER.
AD-629 195 FLD. 15/7

STATISTICAL ANALYSIS
TERMINAL WEATHER PREDICTION TECHNIQUES.
AD-629 094 FLD. 4/2

•WELDING
AUTOMATIC
TRANSLATION OF RUSSIAN PATENT. METHOD OF AUTOMATICWELDING OF STATIONARY OBJECTS WITH CLOSED LINEAR JOINTS.
AD-629 068 FLD. 13/8
DEVELOPMENT OF EQUIPMENT FOR AUTOMATIC NARROW-GAPWELDING FOR SHIPYARD USE.
AD-629 919 FLD. 13/9

ELECTRON BEAMS
ELECTRON BEAM TECHNIQUES FOR FABRICATION AND ASSEMBLYOF PARTS FOR ELECTRON TUBES.
AD-629 979 FLD. 13/8

RECRYSTALLIZATION
TRANSLATION OF RUSSIAN RESEARCH: RECRYSTALLIZATION OFHIGH-MELTING METALS IN WELDING AND SOLDERING.
AD-629 909 FLD. 13/8

TITANIUM ALLOYS
TRANSLATION OF RUSSIAN PATENT. METHOD OF WELDING BY THEFUSING OF BETA-TITANIUM ALLOYS.
AD-629 069 FLD. 13/8

•WEST INDIES
MARINE METEOROLOGY
HEAT FLUX AND SURFACE STRESS ON AND NEAR AN ISLAND IN THETRADE WIND REGION.
AD-629 180 FLD. 4/2

•WIND
GREENLAND
DIURNAL VARIATION OF THE VECTOR SURFACE WIND AT SEVERALICE CAP STATIONS.
AD-629 360 FLD. 4/2

MEASUREMENT
MEASUREMENT OF WIND SHEAR.
AD-629 338 FLD. 4/2
EVALUATION OF METEOROLOGICAL ROCKET WIND SENSORS.
AD-629 388 FLD. 4/2

UPPER ATMOSPHERE
ATMOSPHERIC MOTION: NULL LAYER CONCEPTION IN STRATOSPHERE AND MESOSPHERE, ESPECIALLY IN SPRING AND FALL.
AD-629 216 FLD. 4/2

•WINDDIRECTION INDICATORS
RADIOSONDER
SYSTEM FOR THE DETERMINATION OF THE VERTICAL WIND PROFILEFROM AN AIRCRAFT.
AD-629 188 FLD. 4/2

•WORD ASSOCIATION
SEMANTICS
DEVELOPMENTAL STUDY OF THE SEMANTIC DIFFERENTIAL.
AD-629 403 FLD. 5/10

•X RAYS
SOURCES
VARIABLE INTENSITY ISOTOPIC SOURCES.
AD-629 419 FLD. 18/2

•X-RAY ABSORPTION ANALYSIS
SCIENTIFIC RESEARCH
SOFT X-RAY ABSORPTION.
AD-629 219 FLD. 20/12

•X-RAY DIFFRACTION ANALYSIS
METALLIC CRYSTALS
TRANSLATION OF RUSSIAN RESEARCH. MOSIAC STRUCTURE OFMETALLIC POLYCRYSTALS AND EXTINCTION EFFECTS.
AD-629 249 FLD. 20/2

POLYETHYLENE PLASTICS
REPRINT: X-RAY DIFFRACTION STUDIES OF THE MELTING OFLINEAR POLYETHYLENE.
AD-629 176 FLD. 7/3

•X-RAY SPECTRU
LITHIUM
REPRINT: SOFT X-RAY EMISSION SPECTRUM OF LITHIUM.
AD-629 546 FLD. 20/2

•ZIRCONIUM
CASE HARDENING
TRANSLATION OF RUSSIAN RESEARCH: INVESTIGATION OF THEFORMATION OF AN ALPHA-SOLID SOLUTION OF NITROGEN INZIRCONIUM AT HIGH TEMPERATURES.
AD-629 161 FLD. 13/8

# PERSONAL AUTHOR INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper).


•ACOSTA, ALLAN J.
• • •
HYDRODYNAMICS OF TURBOMACHINES.
AD-625 918 FLD. 10/1

•ADAMOV, A. K.
• • •
APPLICATION OF ANTIBOTULINUM ALIZARINSUSPENSION AGGLUTININS FOR THE RAPID DETECTIONOF THE BOTULISM CAUSATIVE AGENT,
AD-625 620 FLD. 6/13

•ADASKO, V. I.
• • •
EXTERNAL STORAGE FOR COMPUTERS,
AD-625 295 FLD. 9/2

•ADLER, JOEL E. M.
• • •
AN ATTEMPT TO REDUCE THE GAS LOAD IN ANULTRAHIGH-VACUUM CHAMBER.
AD-625 132 FLD. 14/2

•ADLHART, O. J.
• • •
FUEL CELL CATALYSTS.
AD-625 127 FLD. 10/2

•AEIN, JOSEPH M.
• • •
EXPLORATORY MEETING ON THE MAGNETICTAPE RECORDING OF SEISMIC DATA.
AD-625 199 FLD. 17/10

•AFIFI, A. A.
• • •
MISSING VALUES IN MULTIVARIATE STATISTICS.I. REVIEW OF THE LITERATURE.
AD-625 269 FLD. 12/1

•AGHASSI, J. J.
• • •
MASS FORMULA IN THE COVARIANT SPIN-UNITARYSPIN SCHEME,
AD-625 561 FLD. 20/8

•AIPOV, G.
• • •
ABOUT RADIATION INJURIES TO RADIOCOMPONENTS IN A SHARP GAMMA-RADIATIONFIELD,
AD-625 039 FLD. 18/8

•AKE, NELSON E.
• • •
HIGH SPEED POWER AMPLIFIER USING ANELECTRON SWITCHED P-N JUNCTION.
AD-625 420 FLD. 9/5

•AKHURST, DENYS O.
• • •
INTERACTION OF PLASMA FLOWS AND MAGNETICFIELDS.
AD-625 979 FLD. 10/2

•AKS, STANLEY O.
• • •
PROOF THAT SCATTERING IMPLIES PRODUCTION INQUANTUM FIELD THEORY,
AD-625 569 FLD. 20/8

•ALBUM, H. H.
• • •
TOWARD A NATIONAL TECHNICAL INFORMATIONSYSTEM,
AD-625 496 FLD. 5/2

•ALEKSANDROV, N. I.
• • •
IMMUNOLOGICAL ACTIVITY OF LYMPHOID ORGANSDURING AEROSOL AND SUBCUTANIOUS TYPHOIDIMMUNIZATION,
AD-625 631 FLD. 6/13

•ALEKSEIENKO, I. P.
• • •
PROPERTIES OF CULTURES OF ANTHRAXBACILLI GROWN AT VARIOUS TEMPERATURES,
AD-625 629 FLD. 6/13

•ALIEV, KH. M.
• • •
REFLECTION OF SPHERICAL ELASTIC WAVE FROMTHE BOUNDARY OF SEMISPACE,
AD-624 924 FLD. 20/11

•ALIMOV, R. Z.
• • •
HYDRAULIC RESISTANCE AND HEAT AND MASSTRANSFER IN A VORTICAL FLOW,
AD-625 289 FLD. 20/4

•ALLEN, JOHN L.
• • •
ON SURFACE-WAVE COUPLING BETWEENELEMENTS OF LARGE ARRAYS.
AD-625 016 FLD. 9/5

•ALMY, G. M.
• • •
RESEARCH IN NUCLEAR PHYSICS.
AD-625 210 FLD. 20/8

•ALVERSON, W. K.
• • •
RECIPROCAL TEM FERRITE PHASE SHIFTERS.
AD-625 209 FLD. 9/5

•AMBROSE, J. E.
• • •
THE STUDY AND EVALUATION OF ABSORPTION-BASEDCOOLING SYSTEMS FOR USE IN CIVIL DEFENSESHELTERS.
AD-625 436 FLD. 13/1

•ANDERSEN, BIRGER G.
• • •
SYSTEMS ANALYSIS OF AAW TRAINING REQUIREMENTS.
AD-625 378 FLD. 5/9

•ANDERSON, E. L.
• • •
LUBRICATION RESEARCH FOR AERO PROPULSIONSYSTEMS.
AD-625 485 FLD. 11/8

•ANDERSON, G. D.
• • •
EQUATION OF STATE OF SOLIDS: ALUMINUM ANDTEFLON.
AD-625 579 FLD. 20/13

•ANDERSON, R. B.
• • •
MULTIPLEXER SET AN/FCC-17( ) ANDMULTIPLEXER SET AN/MCC-12.
AD-625 549 FLD. 9/5

•ANDREASSI, JOHN L.
• • •
BIOPOTENTIAL SIGNALS AS A FUNCTION OFLEARNING TASK DIFFICULTY.
AD-625 130 FLD. 5/10

•ANDREWS, PAUL A.
• • •
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIES IN ORGANIC AND INORGANICMATERIALS.
AD-624 884 FLD. 20/12

•ANDRIANOV, K. A.
• • •
REACTIONS OF CHLOROMETHYLSILANES ANDSILOXANE WITH DEHYDRIC PHENOLS,
AD-625 613 FLD. 11/9

•ANTONOV, V. V.
• • •
METHOD OF COLLECTING INFORMATION IN ALONG TERM MEMORY DEVICE,
AD-625 240 FLD. 9/2

•ARINUSHKIN, L. S.
• • •
MOUNTING DEVICE FOR CAISSON PUMPS,
AD-625 141 FLD. 13/11

•ARKAD'YEV, V. A.
• • •
FREE HEAT CONVECTION IN TURBINE CLEARANCE,
AD-625 265 FLD. 10/1

•ARMSTRONG, GEORGE T.
• • •
HEATS OF FORMATION OF METALLIC BORIDESBY FLUORINE BOMB CALORIMETRY.
AD-625 336 FLD. 7/4

•ARNOLD, RICHARD F.
• • •
MONOTONE CONGRUENCE ALGORITHMS,
AD-625 046 FLD. 9/2

•ARNOWITT, R.
• • •
SPONTANEOUS SYMMETRY BREAKDOWN AND THEMU-E-GAMMA INTERACTION,
AD-625 963 FLD. 20/8

•ARSENAULT, G. P.
• • •
THE STRUCTURE OF BOSTRYCOIDIN, A BETA-AZAANTHRAQUINONE FROM FUSARIUM SOLANI D2PURPLE,
AD-624 953 FLD. 7/3

•ASHLEY, E. J.
• • •
USE OF AN EVAPORATED DIELECTRIC FILM FORDETERMINING THE OPTICAL CONSTANTS OF AMETAL. I AND II.
AD-624 999 FLD. 20/6

•ASPER, H. K.
• • •
HIGH-RESOLUTION OBSERVATIONS OF THE RADIOSUN AT 9.1 CENTIMETERS ON JULY 20, 1963,
AD-625 366 FLD. 3/2

•AUE, WALTER A.
• • •
THE SYNTHESIS AND PROPERTIES OF TINHYDROPEROXIDES,
AD-625 649 FLD. 7/3

•AUZINS, P.
• • •
POINT DEFECTS IN MAGNESIUM OXIDE,
AD-625 990 FLD. 20/12

•BABANOV, YU. N.
• • •
METHOD OF SEPARATING ONE AMPLITUDEMODULATED SIGNAL FROM TWO MIXED AM SIGNALSWITH SUPERPOSED SPECTRA, BUT DIFFERENTCARRIERS,
AD-625 072 FLD. 9/5

•BABER, B. B.
• • •
LUBRICATION RESEARCH FOR AERO PROPULSIONSYSTEMS.
AD-625 485 FLD. 11/8

•BACK, KURT W.
• • •
SOME PERSONAL AND SITUATIONAL FACTORSRELEVANT TO THE CONSISTENCY AND PREDICTION OFCONFORMING BEHAVIOR,
AD-625 280 FLD. 5/10
• • •
BASES AND CONSEQUENCES OF SYSTEMS OF COMMUNICATION.
AD-625 422 FLD. 5/10

•BACKUS, C. E.
• • •
THE EFFECT OF SIMULATED FISSION PRODUCTS INTHE INTER-ELECTRODE SPACING OF A THERMIONICDIODE.
AD-625 986 FLD. 18/10

•BAHRET, W. F.
• • •
A LOOK INTO THE FUTURE OF RADAR SCATTERINGRESEARCH AND DEVELOPMENT.
AD-629 169 FLD. 17/9

•BAILEY, A. D.
• • •
A STUDY OF HIGH-FREQUENCY DIRECTIONALPROPAGATION OVER A 480 KILOMETER EAST-TOWEST PATH. PART I. DESCRIPTION OF THEDIRECTIONAL PROPAGATION EXPERIMENT (THECOLUMBUS EXPERIMENT). PART II. AN ATLAS OFREDUCED DATA.
AD-629 913 FLD. 17/3

•BAILEY, R.
• • •
ATOMIC TRANSITION SETS CANADA'S TIME,
AD-629 976 FLD. 14/2

•BAKER, C. H.
• • •
X-RAY DIFFRACTION STUDIES OF THE MELTINGOF LINEAR POLYETHYLENE,
AD-629 176 FLD. 7/3

•BAKER, D. D.
• • •
A STANDARDIZED TRANSDUCER CALIBRATIONSYSTEM FOR NAVAL SHIPYARD TRANSDUCER REPAIRFACILITIES,
AD-629 926 FLD. 14/2

•BAKER, D. J.
• • •
DUAL-CHANNEL SATELLITE RADIOMETER.
AD-629 380 FLD. 17/9

•BALDWIN, RICHARD G.
• • •
MULTIPLE ARRAY PROCESSOR.
AD-629 555 FLD. 8/11

•BALLARD, N. H.
• • •
ELECTRON BEAM TECHNIQUES FOR FABRICATIONAND ASSEMBLY OF PARTS FOR ELECTRON TUBES.
AD-629 979 FLD. 13/8

•BARANNIK, V. P.
• • •
METHOD OF OBTAINING LUBRICANT FOR TITANIUMPARTS,
AD-629 160 FLD. 11/8

•BARANOWSKI, J. J.
• • •
MICROWAVE GENERATION FROM AVALANCHINGVARACTOR DIODES,
AD-629 996 FLD. 9/5

•BARBEE, TROY W., JR.
• • •
SOME ASPECTS OF DISLOCATION DYNAMICS INMETALS AND THE INFLUENCE OF DISLOCATIONDISTRIBUTION ON LOW TEMPERATURE ELECTRICALTRANSPORT PROPERTIES,
AD-629 023 FLD. 20/2

•BARNES, STANLEY M.
• • •
TRAINING REQUIREMENTS FOR POSTATTACKADAPTIVE BEHAVIOR.
AD-629 870 FLD. 19/3

•BARONE, R. V.
• • •
INVESTIGATION OF SOLIDIFICATION OF HIGHSTRENGTH STEEL CASTINGS.
AD-629 987 FLD. 11/6

•BASKIN, M. L.
• • •
MUTUAL SOLUBILITY OF COPPER AND MOLYBDENUMAND CERTAIN PROPERTIES OF ALLOYS OF MOLYBDENUMWITH COPPER,
AD-629 908 FLD. 11/6

•BASTIN, E. W.
• • •
A SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.
AD-629 988 FLD. 12/1

•BASTIN, TED
• • •
A SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.
AD-629 988 FLD. 12/1

•BATES, CARL HOBART
• • •
PHASE EQUILIBRIUM STUDIES OF GERMANIUM ANDSILICON AT HIGH PRESSURES.
AD-629 928 FLD. 20/12

•BATYUK, I. F.
• • •
PROPERTIES OF CULTURES OF ANTHRAXBACILLI GROWN AT VARIOUS TEMPERATURES,
AD-629 629 FLD. 6/13

•BAUM, C.
• • •
PROCEEDINGS OF THE SYMPOSIUM ON COMPUTERCENTERED DATA BASE SYSTEMS (2ND).
AD-629 917 FLD. 9/2

•BAVEL, ZAMIR
• • •
ON THE STRUCTURE AND AUTOMORPHISMS OFFINITE AUTOMATA.
AD-629 239 FLD. 9/2

•BECHMANN, RUDOLF
• • •
FORTSCHRITTE AUF DEM GEBIET DERNEBENWELLENBESEITIGUNG IN DIECKNSCHERUNGSSCHWINGENDEN QUARZPLATTEN IMFREQUENZBEREICH VON 5 BIS 100 MHZ (PROGRESS INTHE AREA OF SECONDARY WAVE ELIMINATION IN THICKNESSSHEAR VIBRATION QUARTZ PLATE IN THE FREQUENCY RANGEBETWEEN 5 TO 100 MHZ),
AD-629 949 FLD. 9/5

•BECK, E. J.
• • •
IMPROVED HEAT TRANSFER IN MULTISTAGE FLASHEVAPORATION.
AD-629 267 FLD. 20/13

•BEGUN, N. A.
• • •
AMMONIA MASER (AMMONIA MOLECULARGENERATOR),
AD-629 196 FLD. 20/5

•BEK, R. W.
• • •
STUDY OF GERMANIUM DEVICES FOR USE IN ATHERMOPHOTOVOLTAIC CONVERTER.
AD-629 868 FLD. 9/1

•BELL, EARL J.
• • •
PRIMAL-DUAL DECOMPOSITION PROGRAMMING.
AD-629 369 FLD. 12/2

•BELZER, JACK
• • •
USE OF META-LANGUAGE IN INFORMATIONRETRIEVAL SYSTEMS,
AD-629 977 FLD. 9/2

•BENEDIKTOVA, G. P.
• • •
PROBLEM OF THE BEHAVIOR OF HEAT RESISTANTALLOYS IN CONTACT WITH SODIUM IN STRESSEDSTATE,
AD-629 148 FLD. 11/6

•BENFARI, ROBERT C.
• • •
PERCEPTUAL VERTIGO: A DIMENSIONAL STUDY.
AD-629 929 FLD. 6/19

•BENNETT, JEAN M.
• • •
USE OF AN EVAPORATED DIELECTRIC FILM FORDETERMINING THE OPTICAL CONSTANTS OF AMETAL. I AND II.
AD-629 999 FLD. 20/6

•BENNETTAND, H. E.
• • •
USE OF AN EVAPORATED DIELECTRIC FILM FORDETERMINING THE OPTICAL CONSTANTS OF AMETAL. I AND II.
AD-629 999 FLD. 20/6

•BERNSTEIN, S. E.
• • •
THE CELLULAR BASIS OF THE GENETICALLYDETERMINED HEMOPOIETIC DEFECT IN ANEMICMICE OF GENOTYPE S1/S1(D),
AD-629 523 FLD. 6/16

•BERRY, R. STEPHEN
• • •
CARBALKOXYNITRENES. THE PHOTOLYTIC DECONPOSITION OF GASEOUS ALKYL AZIDOFORMATES,
AD-629 537 FLD. 8/1

•BEZOBRAZOVAND, YU. N.
• • •
ANTIWEAR ADDITIVE FOR LUBRICATING OILS,
AD-629 053 FLD. 11/8

•BHAT, R. R.
• • •
ON THE INDEPENDENCE OF YEARLY WATER INPUTSIN DAMS.
AD-629 898 FLD. 8/8

•BIGELOW, CHARLES D.
• • •
THE POTENTIAL OF MASS PRODUCTION FOREDUCING COSTS IN SHELTER CONSTRUCTION, APRELIMINARY SURVEY.
AD-629 238 FLD. 13/13

•BIGELOW, W. G.
• • •
EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OFETHANOL FROM ARTERIAL BLOOD,
AD-629 521 FLD. 6/5

•BILLINGS, DONALD E.
• • •
DEVELOPING A SYSTEM OF SOLAR FLAREPREDICTION.
AD-629 538 FLD. 3/2

•BINDER, FRANK
• • •
ARRAY RESEARCH.
AD-629 556 FLD. 8/11

•BIONDI, MANFRED A.
• • •
ELECTRONIC AND IONIC COLLISION PROCESSES.
AD-629 313 FLD. 20/8

•BIRKHOFF, GARRETT
• • •
PIECEWISE POLYNOMIAL INTERPOLATION ANDAPPROXIMATION,
AD-629 863 FLD. 12/1
• • •
ESSENTIALLY POSITIVE SYSTEMS OF LINEARDIFFERENTIAL EQUATIONS,
AD-629 876 FLD. 12/1

•BIRKOFF, GARRETT
• • •
FREE BOUNDARY PROBLEMS FOR VISCOUS

FLOWSIN CHANNELS.
AD-629 862 FLD. 20/4

•BISOGNI, EDGARDO
• • •
POINT DEFECTS AND MECHANICAL PROPERTIES OFCOLUMBIUM.
AD-629 478 FLD. 11/6

•BITLER, W. R.
• • •
OPTICAL PROPERTIES OF METALS AND ALLOYS.
AD-629 371 FLD. 11/6

•BLACK, JOHN W.
• • •
COMMUNICATION BY VOICE.
AD-629 861 FLD. 17/2.1

•BLACK, P. E.
• • •
THERMAL DEPOLYMERIZATION OF POLYMETHYLMETHACRYIATE AND POLY-ALPHA-METHYLSTYRENEIN SOLUTION IN VARIOUS SOLVENTS,
AD-629 969 FLD. 7/4

•BLACKSMITH, P., JR.
• • •
THE CONTROL OF ELECTROMAGNETIC SCATTERINGBY IMPEDANCE LOADING.
AD-629 122 FLD. 20/14
• • •
ON MEASURING THE RADAR CROSS SECTIONS OFDUCKS AND CHICKENS.
AD-629 163 FLD. 17/9

•BLACKWELL, BOON-NAM
• • •
HAEMOGLOBIN J AND E IN A THIA KINDRED.
AD-629 459 FLD. 6/5

•BLACKWELL, R. QUENTIN
• • •
HAEMOGLOBIN E IN VIETNAMESE.
AD-629 111 FLD. 6/5
• • •
HAEMOGLOBIN J AND E IN A THIA KINDRED.
AD-629 459 FLD. 6/5

•BLADEL, B. O.
• • •
DETERMINATION OF EQUIVALENCE BETWEENRADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CURED MEATS.
AD-629 252 FLD. 6/8

•BLETZINGER, P.
• • •
THE WAVE NATURE OF MOVING STRIATIONS,
AD-629 189 FLD. 20/9

•BLISS, P. H.
• • •
LUNAR SURFACE VEHICLES, A BRIEF REVIEW OFCURRENT DESIGN CONCEPTS,
AD-629 350 FLD. 13/6

•BLUMER, MAX
• • •
CONTAMINATION OF A LABORATORY BUILDINGBY AIR FILTERS,
AD-629 306 FLD. 14/2

•BLUNT, KEITH
• • •
THE ECONOMIC FEASIBILITY OF DECENTRALIZEDMETROPOLITAN REGIONS.
AD-629 172 FLD. 15/3

•BODNER, S. R.
• • •
AN EXPERIMENTAL INVESTIGATION OF ELASTICPLASTIC PULSE PROPAGATION IN ALUMINUM RODSAT ELEVATED TEMPERATURES.
AD-629 468 FLD. 20/11

•BOER, K. W.
• • •
THE INSTABILITY OF NEGATIVE DIFFERENTIALRESISTANCE.
AD-629 273 FLD. 20/3

•BOGOMOLETSAND, A. A.
• • •
PROPERTIES OF CULTURES OF ANTHRAXBACILLI GROWN AT VARIOUS TEMPERATURES,
AD-629 629 FLD. 6/13

•BOGOMOLOV, V. A.
• • •
AUTOMATIC CONTROL OF POWER OF HYDROELECTRIC STATIONS BY CURRENT FLOW,
AD-629 183 FLD. 10/2

•BOIKO, I. I.
• • •
ON THE WIDTH OF COMBINED RESONANCE BANDS,
AD-629 302 FLD. 7/4

•BOIKO, L. D.
• • •
FREEING THE AIR OF MICROFLORA UNDER THEACTION OF ARTIFICIAL AEROIONIZATION,
AD-629 655 FLD. 6/13

•BOKSHTEIN, S. Z.
• • •
STRUCTURAL IMPERFECTIONS OF METALS DURINGRECRYSTALLIZATION,
AD-629 194 FLD. 11/6

•BOKUT, B. V.
• • •
ON THE THEORY OF THE CONVERSION OF THEFREQUENCY OF LIGHT WAVES BY A CRYSTAL,
AD-629 311 FLD. 20/6

•BOLDT, ROBERT F.
• • •
FACTORING TO FIT OFF DIAGONALS.
AD-629 222 FLD. 9/9

•BOLLINGER, LOREN E.
• • •
FORMATION OF DETONATION WAVES INCOMBUSTIBLE GASEOUS MIXTURES,
AD-629 489 FLD. 19/4

•BOLSHAKOV, G. F.
• • •
INSOLUBLE RESIDUES, FORMING DURING THEHEATING OF JET FUELS,
AD-629 143 FLD. 21/4
• • •
METHOD OF IMPROVING THE THERMO-OXIDATIONSTABILITY OF HYDROCARBON FUELS,
AD-629 247 FLD. 21/4

•BONNELL, M.
• • •
ACRONYMS,
AD-629 208 FLD. 9/2

•BOO, W. O. J.
• • •
MAGNETIC ORDERING IN VF2.
AD-629 211 FLD. 7/4

•BOOKER, AARON
• • •
ARRAY RESEARCH.
AD-629 596 FLD. 8/11

•BORODKIN, V. L.
• • •
REMOTE STARTING DEVICES FOR GAS TURBINES,
AD-629 144 FLD. 21/5

•BORSKY, PAUL N.
• • •
COMMUNITY REACTIONS TO SONIC BOOMS IN THEOKLAHOMA CITY AREA. VOLUME II. DATA ONCOMMUNITY REACTIONS AND INTERPRETATIONS.
AD-629 332 FLD. 1/3

•BOSSARD, B.
• • •
TUNABLE SOLID STATE GENERATOR.
AD-629 310 FLD. 9/5

•BOTKIN, P. P.
• • •
ADDITIVE TO SULFUROUS FUELS FOR HIGH-SPEEDDIESEL ENGINES.
AD-629 246 FLD. 21/4

•BOX, G. E. P.
• • •
A CHANGE IN LEVEL OF A NON-STATIONARY TIMESERIES.
AD-629 496 FLD. 12/1

•BRACEWELL, R. N.
• • •
EXPERIMENTAL INVESTIGATION OF THE COHERENCEDISTANCE OF THE ATMOSPHERE FOR MICROWAVES.
AD-629 991 FLD. 20/14
• • •
HIGH-RESOLUTION OBSERVATIONS OF THE RADIOSUN AT 9.1 CENTIMETERS ON JULY 20, 1963,
AD-629 366 FLD. 3/2

•BRADSHAW, R. T.
• • •
SHIP HULL VIBRATIONS - 9: A GUIDE FOR DESIGNSTAGE CALCULATIONS OF PROPELLAR EXCITEDVIBRATIONS,
AD-629 385 FLD. 13/10

•BRAILOVSKAYA, I. YU.
• • •
DIFFERENTIAL METHOD FOR THE NUMERICALSOLUTION OF TWO DIMENSIONAL NON-STATIONARYNAVIER-STOKES EQUATIONS FOR A COMPRESSIBLEGAS,
AD-629 098 FLD. 20/4

•BRAND, F. A.
• • •
MICROWAVE GENERATION FROM AVALANCHINGVARACTOR DIODES,
AD-629 996 FLD. 9/5

•BRICE, NEIL M.
• • •
ABSTRACTS OF PAPERS FOR WHICH THE RESEARCHWAS SUPPORTED IN PART BY GRANT 2801-21.
AD-629 903 FLD. 4/1

•BRITT, E. J.
• • •
THE EFFECT OF SIMULATED FISSION PRODUCTS INTHE INTER-ELECTRODE SPACING OF A THERMIONICDIODE.
AD-629 586 FLD. 18/10

•BRODE, HAROLD L.
• • •
A SURVEY OF THE WEAPONS AND HAZARDS WHICHMAY FACE THE PEOPLE OF THE UNITED STATES INWARTIME,
AD-629 291 FLD. 19/3

•BRODY, H. D.
• • •
INVESTIGATION OF SOLIDIFICATION OF HIGHSTRENGTH STEEL CASTINGS.
AD-629 987 FLD. 11/6

•BROOKS, F. A.
• • •
RESEARCH ON CONSIDERATION OF TRAININGFUNCTIONS DURING DESIGN OF OPERATIONALEQUIPMENT.

AD-629 129 FLD. 9/9

•BROWN, A. G.
• • •
TRANSFER OF AIR THROUGH ADSORBED SURFACEFILMS AS A FACTOR IN FOAM STABILITY.
AD-629 344 FLD. 11/11
• • •
PRIMARY ADSORPTION DURING FOAM FORMATION.
AD-629 343 FLD. 11/11
• • •
THE PHYSICAL CHEMISTRY AND STABILITY OFBUBBLES WITH SPECIAL REFERENCE TO AQUEOUSSOLUTIONS. SURFACE VISCOSITY OF DETERGENTSOLUTIONS AS A FACTOR IN FOAM STABILITY.
AD-629 346 FLD. 11/11

•BROWN, JOHN LOTT
• • •
FLASH BLINDNESS,
AD-629 281 FLD. 6/5
• • •
LUMINANCE, PURITY AND WAVELENGTH MATCHES OFCONTRAST COLORS,
AD-629 282 FLD. 6/16

•BROWN, STEPHEN L.
• • •
DISINTEGRATION RATE MULTIPLIERS IN BETAEMITTER DOSE CALCULATIONS.
AD-629 359 FLD. 6/18

•BROWNSTEIN, S.
• • •
EXCHANGE REACTIONS IN THE SYSTEM BORONTRIFLUORIDEMETHANOL,
AD-629 969 FLD. 7/9
• • •
TACTICITY DETERMINATIONS ON ALLYLMETHACRYLATE POLYMERS.
AD-629 977 FLD. 11/9

•BRUK, YU. A.
• • •
METHOD OF IMPROVING THE THERMO-OXIDATIONSTABILITY OF HYDROCARBON FUELS,
AD-629 247 FLD. 21/9

•BRUNER, L. J.
• • •
THE ELECTRICAL PROPERTIES OF SEMIPERMEABLEMEMBRANES.
AD-629 970 FLD. 7/9

•BRYDEN, M. P.
• • •
THE MANIPULATION OF STRATEGIES OF REPORT INDICHOTIC LISTENING,
AD-629 106 FLD. 5/10
• • •
SPATIAL ORGANIZATION OF CHILDREN'SRESPONSES TO A PICTORIAL DISPLAY,
AD-629 107 FLD. 5/10

•BUCKMASTER, H. A.
• • •
AN ELECTROMECHANICAL VERSION OF THE IGYRIOMETER,
AD-629 083 FLD. 14/2
• • •
COSMIC NOISE AND MAGNETIC MEASUREMENTSAT CALGARY DURING THE SOLAR ECLIPSE OF JULY20, 1963.
AD-629 108 FLD. 3/2

•BULATOVA, T. I.
• • •
APPLICATION OF ANTIBOTULINUM ALIZARINSUSPENSION AGGLUTININS FOR THE RAPID DETECTIONOF THE BOTULISM CAUSATIVE AGENT,
AD-629 620 FLD. 6/13

•BUNCE, ELIZABETH T.
• • •
CRUISE PLANS FOR R/V CHAIN CRUISE NO. 43,INDIAN OCEAN EXPEDITION.
AD-629 999 FLD. 8/10

•BURGE, D. K.
• • •
USE OF AN EVAPORATED DIELECTRIC FILM FORDETERMINING THE OPTICAL CONSTANTS OF AMETAL. I AND II.
AD-629 999 FLD. 20/6

•BURKHART, T. H.
• • •
A STUDY OF TURBULENT FLOW IN ROUGH PIPES.
AD-629 037 FLD. 20/9

•BURMAKIN, N. M.
• • •
ANTIWEAR ADDITIVE FOR LUBRICATING OILS,
AD-629 059 FLD. 11/8

•BURSHTEIN, L. S.
• • •
STUDY OF LOCAL STRAIN DURING BENDING OF AHOLLOW SHAFT,
AD-629 249 FLD. 20/11

•BURTON, C. D.
• • •
SYNTHESIS AND EVALUATION OF NEW FIRERESISTANT HYDRAULIC FLUIDS.
AD-629 209 FLD. 11/8

•BUSER, RUDOLF G.
• • •
PRESSURE BURSTS IN BAKEABLE ULTRA-HIGHVACUUM VALVES DURING OPENING AND CLOSING.
AD-629 120 FLD. 13/11

•BUTKOV, N. A.
• • •
ADDITIVE TO SULFUROUS FUELS FOR HIGH-SPEEDDIESEL ENGINES,
AD-629 246 FLD. 21/9

•BUTLER, C. A.
• • •
DEVELOPMENT OF EQUIPMENT FOR AUTOMATICNARROW-GAP WELDING FOR SHIPYARD USE.
AD-629 919 FLD. 13/9

•BUVINGER, E. A.
• • •
ANALYSIS OF THIN FILMS OF TANTALUMREACTIVELY SPUTTERED IN NITROGEN ATMOSPHERE.
AD-629 989 FLD. 7/2

•BYWATER, S.
• • •
THERMAL DEPOLYMERIZATION OF POLYMETHYLMETHACRYIATE AND POLY-ALPHA-METHYLSTYRENEIN SOLUTION IN VARIOUS SOLVENTS,
AD-629 969 FLD. 7/9

•CAFFREY, JOHN G.
• • •
COMPUTERS IN SYSTEMS OF HIGHER EDUCATION,
AD-629 937 FLD. 5/9

•CAHILL, J. A.
• • •
PLASMA JET CHEMISTRY,
AD-629 991 FLD. 20/9

•CALAIS, JEAN-LOUIS
• • •
DIFFERENT BANDS FOR DIFFERENT SPINS. I. THECOHESIVE ENERGY OF AN ALKALI METAL. II. APPLICATION TO A LINEAR CHAIN OF HYDROGEN ATOMS.CRYSTAL INTEGRALS AND MOLECULAR INTEGRALS,
AD-629 911 FLD. 7/9

•CALL, S. M.
• • •
THEORETICAL ERROR OF THE AUTOMATIC SOUNDDERIVATIVE DEVICE.
AD-629 012 FLD. 14/2

•CALVERT, L. D.
• • •
THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM,
AD-629 967 FLD. 11/6

•CAMERON, H. L.
• • •
RADAR AND GEOLOGY.
AD-629 887 FLD. 8/2

•CARBONELL, LUIS M.
• • •
CYTOCHEMISTRY AND BIOCHEMISTRY OF P.BRASILIENSIS.
AD-629 973 FLD. 6/1

•CAREW, T. E.
• • •
VARIABLE INTENSITY ISOTOPIC SOURCES.
AD-629 915 FLD. 18/2

•CARLEY, D. R.
• • •
TRANSISTOR, VHF, SILICON, POWER, LINEAR,30-MC, 100 WATTS PEP.
AD-629 325 FLD. 9/1

•CARR, C. JELLEFF
• • •
A NEW APPROACH TO STUDIES OF MUCUS FLOWAND CILIARY ACTIVITY.
AD-629 916 FLD. 6/12

•CARR, W.
• • •
ACRONYMS,
AD-629 208 FLD. 5/2

•CARRERA, RICHARD N.
• • •
CHANGES IN THE JUDGMENTS OF SENSITIZERSAND REPRESSERS IN RESPONSE TO FAILURE ANDSUCCESS EVALUATIONS OF GROUP PERFORMANCE,
AD-629 022 FLD. 5/10

•CASE, CARL T.
• • •
ON TRANSIENT WAVE PROPAGATION IN A PLASMA.
AD-629 133 FLD. 20/14

•CASSIDY, B. R.
• • •
A TRANSISTORIZED CATHODE-RAY PHASE-SENSITIVENULL DETECTOR,
AD-629 957 FLD. 9/3

•CASSIDY, MICHAEL
• • •
PRODUCTION ENGINEERING MEASURE FOR SILICONOVERLAY TRANSISTORS.
AD-629 317 FLD. 9/1

•CAVA, M. P.
• • •
2,3-NAPHTHOQUINONOID HETEROCYCLES. II. AHIGHLY STABILIZED THIADIAZOLE ANALOG OFANTHRACENE.
AD-629 636 FLD. 7/3
• • •
THE SYNTHESIS OF A PHENANTHRIDENE FROMAN AROMATIC SCHIFF BASE BY A PHOTOOXIDATIVERING CLOSURE.
AD-629 637 FLD. 7/3
• • •
THE PHOTOLYTIC DECOMPOSITION OF SONESULFONES BY AN INTERNALLY SENSITIZED PATH,
AD-629 638 FLD. 7/3

•CAVA, MICHAEL P.
• • •

THE PHOTOCHEMICAL SYNTHESIS OF POLYAZACYCLOBUTANE SYSTEMS.
AD-629 218 FLD. 7/3

•CAVALLARI, JOHN D.
• • •
BIOPOTENTIAL SIGNALS AS A FUNCTION OFLEARNING TASK DIFFICULTY.
AD-629 130 FLD. 5/10

•CAVENESS, WILLIAM FIELDS
• • •
THE RELATION BETWEEN CRANIOCEREBRALTRAUMA AND ITS SEQUELAE.
AD-629 031 FLD. 6/5

•CERNICHIARI, O. M.
• • •
LASER-PUMPED LASER.
AD-629 338 FLD. 20/5

•CHADAN, K.
• • •
THE RICCATI EQUATION AND REGGE POLES,
AD-629 388 FLD. 12/1

•CHALMERS, R. A.
• • •
FE54(N,P), (N, ALPHA), AND (N,2N) CROSS SECTIONS,
AD-629 980 FLD. 20/8

•CHANDLER, H.
• • •
DESIGN OF A TEST MODEL FOR A SOLID ELECTROLYTECARBON DIOXIDE REDUCTION SYSTEM.
AD-629 982 FLD. 6/11

•CHANG, WILLIAM W.
• • •
STUDY FOR GENERALIZED MODEL FOR SEMICONDUCTOR RADIATION RESPONSE PREDICTION.
AD-629 341 FLD. 18/8

•CHAPLYGINA, V. S.
• • •
STRUCTURAL IMPERFECTIONS OF METALS DURINGRECRYSTALLIZATION,
AD-629 194 FLD. 11/6

•CHARNES, ABRAHAM
• • •
APPLICATION OF CHANCE-CONSTRAINED PROGRAMMING TO SOLUTION OF THE SO-CALLED 'SAVINGSAND LOAN ASSOCIATION' TYPE OF PROBLEM,
AD-629 050 FLD. 12/2

•CHASE, EDWARD N.
• • •
RESEARCH ON ADVANCED DYNAMIC ATTRIBUTEEXTRACTION TECHNIQUES.
AD-629 181 FLD. 9/2

•CHEN, C. L.
• • •
BASIC PLASMA PROCESSES.
AD-629 927 FLD. 20/9

•CHENG, HENRY M.
• • •
WAKE ANALYSIS OF SHIP MODELS: SINGLE-SCREWMERCHANT-TYPE,
AD-629 327 FLD. 13/10

•CHERNYI, . G.
• • •
GRANDIOSE ARE THE ACHIEVEMENTS OF SCIENCE,
AD-629 142 FLD. 21/3

•CHERNYSHEVA, M. I.
• • •
A STUDY OF IMMUNOGENESIS FOLLOWINGVACCINATION WITH THE LIVE ASSOCIATED VACCINE.REPORT I. A STUDY OF IMMUNOGENESIS IN GUINEAPIGS VACCINATED WITH BRUCELLOSIS AND ANTHRAXVACCINE,
AD-629 651 FLD. 6/13

•CHERTKOV, YA. B.
• • •
CHARACTERISTICS OF MICROCONTAMINATIONS INAVERAGE DISTILLATE FUELS,
AD-629 149 FLD. 21/5

•CHIEN, LI-CHIN
• • •
HAEMOGLOBIN E IN VIETNAMESE.
AD-629 111 FLD. 6/5

•CHIH-CHIANG, WANG
• • •
COHERENCE PROPERTIES OF ELECTROMAGNETICRADIATION,
AD-629 038 FLD. 20/6

•CHOW, T. J.
• • •
CONCENTRATIONS OF COMMON LEAD INGREENLAND SNOWS,
AD-629 947 FLD. 8/5

•CHOW, TSAIHWA J.
• • •
RADIOGENIC LEADS OF THE CANADIAN ANDBALTIC SHIELD REGIONS,
AD-629 998 FLD. 8/5

•CHUPIS, M. M.
• • •
EFFECT OF OIL OXIDATION ON THE PROCESS OFRUNNING-IN A RING-SOCKET PAIR IN AN INTERNALCOMBUSTION ENGINE,
AD-629 910 FLD. 21/7

•CLIFTON, R. J.
• • •
AN EXPERIMENTAL INVESTIGATION OF ELASTICPLASTIC PULSE PROPAGATION IN ALUMINUM RODSAT ELEVATED TEMPERATURES.
AD-629 468 FLD. 20/11

•COGSWELL, JOHN F.
• • •
THE DESIGN OF MAN-MACHINE SYSTEMS INEDUCATION.
AD-629 992 FLD. 5/9

•COHEN, ARTHUR M.
• • •
CHANGES IN THE JUDGMENTS OF SENSITIZERSAND REPRESSERS IN RESPONSE TO FAILURE ANDSUCCESS EVALUATIONS OF GROUP PERFORMANCE,
AD-629 022 FLD. 5/10

•COHEN, THEODORE
• • •
THE REACTIONS OF 2- AND 4-PICOLINE N-OXIDESWITH PHENYLACETIC ANHYDRIDE.
AD-629 039 FLD. 7/3
• • •
DEOXYGENATION REACTIONS OF AMINE OXIDES ANDSULFOXIDES.
AD-629 919 FLD. 7/3

•COHN, J. G.
• • •
FUEL CELL CATALYSTS.
AD-629 127 FLD. 10/2

•COLE, LEONARD J.
• • •
THE SEQUENCE OF EVENTS IN RADIATIONCARCINOGENESIS: A UNIFYING FORMULATION,
AD-629 917 FLD. 6/18

•COLL, JORGE A.
• • •
POINT DEFECTS AND MECHANICAL PROPERTIES OFCOLUMBIUM.
AD-629 979 FLD. 11/6

•COLLINS, DAVID G.
• • •
MONTE CARLO CODES FOR STUDY OF LIGHTTRANSPORT IN THE ATMOSPHERE, VOLUME I:DESCRIPTION OF CODES.
AD-629 115 FLD. 20/6
• • •
MONTE CARLO CODES FOR STUDY OF LIGHTTRANSPORT IN THE ATMOSPHERE, VOLUME II:UTILIZATION INSTRUCTIONS.
AD-629 116 FLD. 20/6

•COMBS, ANDREW C.
• • •
APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY,
AD-629 998 FLD. 4/2

•COMMERFORD, G. E.
• • •
THE STUDY AND EVALUATION OF ABSORPTION-BASEDCOOLING SYSTEMS FOR USE IN CIVIL DEFENSESHELTERS.
AD-629 936 FLD. 13/1

•COMSTOCK, R. L.
• • •
AMPLIFICATION OF MAGNETOELASTIC WAVES INYTTRIUM IRON GARNET AT 300K,
AD-629 981 FLD. 20/12

•CONLEY, EUGENE O.
• • •
AN ANALOG COMPUTER STUDY OF VAN DER POL'SEQUATION AND ITS RESPONSE TO WHITE GAUSSIANNOISE.
AD-629 372 FLD. 12/1

•CONN, A.
• • •
PRODUCTION ENGINEERING MEASURE. HIGHVOLTAGE SILICON RECTIFIER STACKS.
AD-629 928 FLD. 9/1

•COOL, L. G.
• • •
GLASS TRANSITIONS IN IONIC POLYMERS.
AD-629 330 FLD. 11/9

•COPE, P.
• • •
EFFECT OF EXPOSURE TO OXYGEN ON CHANGESIN MEATS AND VEGETABLES DURING STORAGE.
AD-629 984 FLD. 6/8

•CORDIANO, H. V.
• • •
STRESS CRACKING PROPERTIES OF TI-721 ALLOYTITANIUM LARGE SCALE BUTT WELDED AND BASEPLATE SPECIMENS IN AIR AND SEA WATER.
AD-629 932 FLD. 11/6

•CORNELL, DOUGLAS W.
• • •
CARBALKOXYNITRENES. THE PHOTOLYTIC DECOMPOSITION OF GASEOUS ALKYL AZIDOFORMATES,
AD-629 937 FLD. 8/1

•CORREA, J. J.
• • •
PLASMA JET CHEMISTRY.
AD-629 991 FLD. 20/9

•COTE, ALFRED J., JR.
• • •
SYNTHETIC NERVE NETWORKS.
AD-629 229 FLD. 6/9

•COTTON, F. A.
• • •
THE CRYSTAL AND MOLECULAR STRUCTURE OFPENTAKIS(METHYLISONITRILE)COBALT(I) PERCHLORATE,

AD-629 639 FLD. 7/4

• • •

CRYSTAL STRUCTURE OF TETRAMERIC COBALT(II)ACETYLACETONATE,
AD-629 643 FLD. 7/4

• • •

INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARYARSINE OXIDES,
AD-629 646 FLD. 7/4

•COULTAS, T. A.

• • •

RESPONSE OF A BURNING SOLID PROPELLANT TOPRESSURE WAVES OF FINITE AMPLITUDE.
AD-629 999 FLD. 21/9

•COVINGTON, A. E.

• • •

2,700 MC./S. SOLAR PATROL AT THE DOMINIONRADIO ASTROPHYSICAL OBSERVATORY, PENTICTON,B.C.
AD-629 958 FLD. 3/2

•COWIE, JAMES MCMAHON

• • •

THE EFFECTS OF EXTREME ULTRAVIOLETRADIATION ON THE REFLECTANCE OF THERMALCONTROL SURFACE COATINGS.
AD-629 992 FLD. 22/2

•CRAGG, L. H.

• • •

SEMIQUANTITATIVE ASPECT OF SHORTBRANCH DETECTION BY USING POLYELECTROLYTEEXPANSIVE EFFECTS,
AD-629 929 FLD. 7/4

•CRAIG, H.

• • •

ISOTOPIC OCEANOGRAPHY: DEUTERIUM ANDOXYGEN 18 VARIATIONS IN THE OCEAN AND THEMARINE ATMOSPHERE,
AD-629 950 FLD. 8/10

•CRAWFORD, ANNE L.

• • •

THE EFFECT OF TOLBUTAMIDE (RASTINON) ONTHE LEVELS OF GLUCOSE AND INORGANIC PHOSPHORUS OF BLOOD IN NORMOTHERMIC AND HYPOTHERMIC RATS,
AD-629 908 FLD. 6/19

•CROUCH, D. P.

• • •

STUDY OF GERMANIUM DEVICES FOR USE IN ATHERMOPHOTOVOLTAIC CONVERTER.
AD-629 868 FLD. 9/1

•CUADRA, D. E.

• • •

A BRIEF COMMENT ON THE HYDRAULIC ANALOGYOF AN ACOUSTIC WAVE IN A PIPE,
AD-629 088 FLD. 20/14

•CULVAHOUSE, J. W.

• • •

PARAMAGNETIC RESONANCE OF TRIVALENTFE57 IN DOUBLE NITRATE CRYSTALS,
AD-629 872 FLD. 7/4

•CUMMINS, S. E.

• • •

SWITCHING BEHAVIOR OF FERROELECTRICBI4TI3012.
AD-629 013 FLD. 20/3

•CURRAN, DANIEL R.

• • •

FORTSCHRITTE AUF DEM GEBIET DERNEBENWELLENBESEITIGUNG IN DIECKNSCHERUNGSSCHWINGENDEN QUARZPLATTEN INFREQUENZBEREICH VON 9 BIS 100 MHZ (PROGRESS INTHE AREA OF SECONDARY WAVE ELIMINATION IN THICKNESSSHEAR VIBRATION QUARTZ PLATE IN THE FREQUENCY RANGEBETWEEN 9 TO 100 MHZ),
AD-629 999 FLD. 9/5

•CURRAY, JOSEPH R.

• • •

STRUCTURE OF THE CONTINENTAL MARGIN OFFCENTRAL CALIFORNIA,
AD-629 999 FLD. 8/7

•CURTISS, C. F.

• • •

QUANTUM-MECHANICAL BOLTZMANN EQUATION,
AD-629 881 FLD. 20/10

•CVETANOVIC, R. J.

• • •

EXCITED OXYGEN ATOMS IN THE PHOTOLYSIS OFN2O AND NO2,
AD-629 971 FLD. 8/1

•CZERWINSKI, W. P.

• • •

ON OPTIMIZING EFFICIENCY AND BANDWITH OFINDUCTIVELY LOADED ANTENNAS,
AD-629 991 FLD. 9/5

•DAAMS, H.

• • •

ATOMIC TRANSITION SETS CANADA'S TIME,
AD-629 976 FLD. 14/2

•DAFERMOS, CONSTANTINE

• • •

FINITE DEFORMATIONS UNDER PRESSURIZATION INAN INFINITELY LONG, THICK-WALLED, NONLINEARLYVISCOELASTIC CYLINDER IDEALLY BONDED TO A THINELASTIC CASE.
AD-629 219 FLD. 20/11

•DAIS, C. F.

• • •

ION RADICALS, VII. THE REACTIONS OFTHIANTHRENE OXIDE IN HYDROCHLORIC ACID,
AD-629 990 FLD. 7/3

•DALE, JOHN R.

• • •

A FORCE BALANCE ANALOG FOR DETERMININGCHARACTERISTICS OF OCEAN CABLE SYSTEMS.
AD-629 930 FLD. 13/10

•DANIELSEN, E. F.

• • •

OBJECTIVE CROSS-SECTION ANALYSIS.
AD-629 137 FLD. 4/1

•DANNLEY, RALPH L.

• • •

THE DECOMPOSITION OF SILYL HYDROPEROXIDES,
AD-629 698 FLD. 7/3

• • •

THE SYNTHESIS AND PROPERTIES OF TINHYDROPEROXIDES,
AD-629 699 FLD. 7/3

• • •

THE SYNTHESIS AND REACTIONS OF BISDIPHENYLPHOSPHINIC PEROXIDE,
AD-629 690 FLD. 7/3

•DAUWALDER, JOHN H.

• • •

DISCRETE REPRESENTATIONS OF PARTIALDIFFERENTIAL OPERATORS.
AD-629 699 FLD. 12/1

•DAVIDOVITS, P.

• • •

THE EFFECTS OF OPTICAL PUMPING ON THERB87 MASER OSCILLATOR.
AD-629 929 FLD. 20/5

•DAVIDSON, D. W.

• • •

ENTROPY CHANGES AT THE PHASE TRANSITIONSIN ICE,
AD-629 974 FLD. 7/4

•DAVIS, D. F.

• • •

THE EFFECT OF PRESSURE ON THE DISSOCIATIONOF MANGANESE SULFATE ION PAIRS IN WATER,
AD-629 989 FLD. 7/4

•DAVIS, KEITH E.

• • •

SOME PERSONAL AND SITUATIONAL FACTORSRELEVANT TO THE CONSISTENCY AND PREDICTION OFCONFORMING BEHAVIOR,
AD-629 280 FLD. 5/10

•DAVIS, MONTE V.

• • •

THE EFFECT OF SIMULATED FISSION PRODUCTS INTHE INTER-ELECTRODE SPACING OF A THERMIONICDIODE.
AD-629 986 FLD. 18/10

•DAVISON, ROY

• • •

THE SYSTEM VIEW AND THE DISENCHANTEDEXECUTIVE.
AD-629 002 FLD. 5/1

•DE BOOR, CARL R.

• • •

PIECEWISE POLYNOMIAL INTERPOLATION ANDAPPROXIMATION,
AD-629 863 FLD. 12/1

•DECLARIS, N.

• • •

A SYNTHESIS METHOD FOR LINEAR TIME-VARYINGSYSTEMS.
AD-629 983 FLD. 9/3

•DEICH, M. E.

• • •

EXPERIMENTAL STUDY OF A MODEL CONTROLBLEEDER STAGE WITH A ROTATING DIAPHRAGM,
AD-629 194 FLD. 21/5

•DEIROSSI, JAMES

• • •

THE ECONOMIC FEASIBILITY OF DECENTRALIZEDMETROPOLITAN REGIONS.
AD-629 172 FLD. 15/3

•DEL RIO, C. J.

• • •

AN EXPERIMENTAL STUDY OF STRESSES AT THEINTERFACE OF PROPELLANT GRAINS AND MOTORCASES DUE TO THERMAL LOADING OF THESHRINKAGE TYPE. STRESSES IN SQUARE SLABS,WITH DIFFERENT EDGE GEOMETRIES, WHENBONDED ON ONE FACE TO A RIGID PLATE ANDSHRUNK.
AD-629 220 FLD. 21/9

•DEMASSA, T. A.

• • •

RESEARCH ON CROSSED-FIELD ELECTRONDEVICES.
AD-629 938 FLD. 9/1

•DEMIN, V. N.

• • •

PRODUCTION PROCESS FOR FOAM PLASTICS,
AD-629 168 FLD. 11/9

•DENISON, R.

• • •

A CALORIMETRIC STUDY OF THE FUSION OFMOLECULAR WEIGHT FRACTIONS OF LINEARPOLYETHYLENE,
AD-629 177 FLD. 7/3

•DENNING, PETER JAMES

• • •

QUEUEING MODELS FOR FILE MEMORY OPERATION.
AD-629 943 FLD. 9/2

•DERSE, PHILIP H.
• • •
SURVEY OF EXISTING METHODS OF FEEDING ANDHOUSING THE CHIMPANZEE.
AD-629 101 FLD. 6/3

•DERYAGIN, B. V.
• • •
THE INVALIDITY OF A PURELY THERMODYNAMICTREATMENT OF THE ADHESION OF SOLIDS,
AD-629 603 FLD. 7/4

•DESER, S.
• • •
SPONTANEOUS SYMMETRY BREAKDOWN AND THEMU-E-GAMMA INTERACTION,
AD-629 963 FLD. 20/8

•DESROSIERS, PAUL E.
• • •
BLAST EFFECTS ON U. S. ARMY WATER-STORAGECONTAINERS.
AD-629 396 FLD. 19/4

•DETERT, D. G.
• • •
A STUDY OF HIGH-FREQUENCY DIRECTIONALPROPAGATION OVER A 950 KILOMETER EAST-TOWEST PATH. PART I. DESCRIPTION OF THEDIRECTIONAL PROPAGATION EXPERIMENT (THECOLUMBUS EXPERIMENT). PART II. AN ATLAS OFREDUCED DATA.
AD-629 913 FLD. 17/3

•DEUTER, J.
• • •
HIGH-RESOLUTION OBSERVATIONS OF THE RADIOSUN AT 9.1 CENTIMETERS ON JULY 20, 1963,
AD-629 366 FLD. 3/2

•DEUTSCH, MORTON
• • •
CONFLICT AND ITS RESOLUTION.
AD-629 918 FLD. 5/10
• • •
TECHNIQUES OF INDUCING COOPERATIONBETWEEN ADVERSARIES.
AD-629 921 FLD. 5/10

•DEVANE, MARK E.
• • •
TELEMETRY ANTENNA FOR LINCOLN EXPERIMENTALSATELLITES LES-1 AND LES-2.
AD-629 936 FLD. 9/6

•DE VAUCOULEURS, ANTOINETTE
• • •
SPECTROSCOPIC AND RADIAL VELOCITY SURVEYOF BRIGHT GALAXIES.
AD-629 900 FLD. 3/2

•DE VAUCOULEURS, GERARD
• • •
SPECTROSCOPIC AND RADIAL VELOCITY SURVEYOF BRIGHT GALAXIES.
AD-629 900 FLD. 3/2

•DEVRIES, GERRIT
• • •
HIGH-PRESSURE GAS FROM LITHIUM HYDRIDE ANDSEA WATER,
AD-629 513 FLD. 19/8

•DIBELLO, FRANK A.
• • •
THE DEFINITION OF REQUIREMENTS FOR A SEALAUNCHED MISSILE INFORMATION-ANALYSISCENTER.
AD-629 193 FLD. 5/2

•DI PRIMIO, JUAN C.
• • •
POINT DEFECTS AND MECHANICAL PROPERTIES OFCOLUMBIUM.
AD-629 478 FLD. 11/6

•DOBROSERDOV, L. L.
• • •
ON THE PROBLEM OF SEPARATING HYDROAZEOTROPES,
AD-629 930 FLD. 7/4
• • •
LIQUID-VAPOR PHASE EQUILIBRIUM OF ALCOHOL WATER MIXTURES IN THE PRESENCE OF CERTAINSALTS, AT ATMOSPHERIC PRESSURE,
AD-629 931 FLD. 7/4

•DODD, R. A.
• • •
MECHANISMS OF TRANSGRANULAR STRESSCORROSION CRACKING OF SOLID SOLUTION ALLOYS,
AD-629 994 FLD. 11/6

•DODD, ROBERT T. , JR.
• • •
SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARYCHONDRITES.
AD-629 165 FLD. 8/7

•DOLGOPLOSK, B.
• • •
TRANSFORMATION OF RUBBER,
AD-629 099 FLD. 11/10

•DONALSKI, EUGENE S.
• • •
HEATS OF FORMATION OF METALLIC BORIDESBY FLUORINE BOMB CALORIMETRY.
AD-629 336 FLD. 7/4

•DONALDSON, G. R.
• • •
PERIODICALLY ADJUSTED FEEDBACK CONTROLSMULTIPLIER PHOTOTUBE,
AD-629 959 FLD. 9/5

•DONNELLY, R. F.
• • •
A STUDY OF HIGH-FREQUENCY DIRECTIONALPROPAGATION OVER A 950 KILOMETER EAST-TOWEST PATH. PART I. DESCRIPTION OF THEDIRECTIONAL PROPAGATION EXPERIMENT (THECOLUMBUS EXPERIMENT). PART II. AN ATLAS OFREDUCED DATA.
AD-629 913 FLD. 17/3

•DORAN, D. G.
• • •
ELECTRICAL EFFECTS OF SHOCK WAVES: CONDUCTIVITY IN CSI, KI, AND NACL.
AD-629 948 FLD. 20/11
• • •
EQUATION OF STATE OF SOLIDS: ALUMINUM ANDTEFLON.
AD-629 979 FLD. 20/13

•DRAPER, NORMAN R.
• • •
MIXTURE DESIGNS FOR FOUR FACTORS.
AD-629 269 FLD. 12/1

•DRESSELHAUS, G.
• • •
SPIN-ORBIT INTERACTION IN GRAPHITE,
AD-629 017 FLD. 20/12

•DRESSELHAUS, M. S.
• • •
SPIN-ORBIT INTERACTION IN GRAPHITE,
AD-629 017 FLD. 20/12

•DRUESNE, M. A.
• • •
MICROWAVE GENERATION FROM AVALANCHINGVARACTOR DIODES,
AD-629 946 FLD. 9/5

•DUCE, ROBERT A.
• • •
GEOCHEMISTRY OF IODINE, BROMINE, ANDCHLORIDE IN THE AIR-SEA-SEDIMENT SYSTEM,
AD-629 319 FLD. 8/5

•DUDA, P. D.
• • •
AUDITORY SENSITIVITY AFTER PROLONGEDVISUAL DEPRIVATION,
AD-629 928 FLD. 6/16

•DUGDALE, J. S.
• • •
THE EFFECT OF PRESSURE AND TEMPERATUREON THE ELECTRICAL RESISTANCE OF RUBIDIUM ANDCAESIUM,
AD-629 970 FLD. 11/6

•DUGUNDJI, JOHN
• • •
THEORETICAL CONSIDERATIONS OF PANEL FLUTTERAT HIGH SUPERSONIC MACH NUMBERS,
AD-629 999 FLD. 20/11

•DUMCHUS, M. V.
• • •
A STUDY OF ANTIFRICTION ALLOYS OF THE'ALCUSIP' TYPE,
AD-629 911 FLD. 11/6

•DUNNE, T. G.
• • •
THE CRYSTAL AND MOLECULAR STRUCTURE OFPENTAKIS(METHYLISONITRILE)COBALT(I ) PERCHLORATE,
AD-629 639 FLD. 7/4

•DUPEE, WILLIAM D.
• • •
THE RESPONSE OF SELECTED ROCK SPECIMENSTO VACUUM ULTRAVIOLET LIGHT.
AD-629 393 FLD. 8/7

•DUQUET, R. T.
• • •
OBJECTIVE CROSS-SECTION ANALYSIS,
AD-629 137 FLD. 9/1

•DURELLI, A. J.
• • •
AN EXPERIMENTAL STUDY OF STRESSES AT THEINTERFACE OF PROPELLANT GRAINS AND MOTORCASES DUE TO THERMAL LOADING OF THESHRINKAGE TYPE. STRESSES IN SQUARE SLABS,WITH DIFFERENT EDGE GEOMETRIES, WHENBONDED ON ONE FACE TO A RIGID PLATE ANDSHRUNK.
AD-629 220 FLD. 21/9

•DWORK, BERNARD
• • •
ON THE ZETA FUNCTION OF A HYPERSURFACE,
AD-629 977 FLD. 12/1

•DYACHENKO, S. S.
• • •
PROPERTIES OF CULTURES OF ANTHRAXBACILLI GROWN AT VARIOUS TEMPERATURES,
AD-629 629 FLD. 6/19

•EASLEY, F. N.
• • •
MULTIPLEXER SET AN/FCC-17( ) ANDMULTIPLEXER SET AN/MCC-12.
AD-629 949 FLD. 9/5

•EASTMAN, R. H.
• • •
FACTORS INVOLVED IN THE STABILITY OFCYCLOPROPANES.
AD-629 080 FLD. 7/3

•EDELEN, DOMINIC G. B.
• • •
LORENTZ INVARIANCE, MOMENTUM-ENERGYTENSORS, AND THE M H D PROBLEM.



799-657 O - 66 - 11

AD-629 268 FLD. 20/9

•EDEN, R. J.
• • •
THE PROBLEM OF CAUSALITY IN S-MATRIXTHEORY,
AD-629 397 FLD. 20/10

•EDMONDS, JACK
• • •
PATHS, TREES, AND FLOWERS,
AD-629 903 FLD. 12/2
• • •
ON THE SURFACE DUALITY OF LINEAR GRAPHS,
AD-629 904 FLD. 12/2
• • •
MINIMUM PARTITION OF A MATROID INTOINDEPENDENT SUBSETS,
AD-629 905 FLD. 12/2
• • •
LEHMAN'S SWITCHING GAME AND A THEOREM OFTUTTE AND NASH-WILLIAMS,
AD-629 906 FLD. 12/2
• • •
MAXIMUM MATCHING AND A POLYHEDRON WITHO,1-VERTICES,
AD-629 907 FLD. 12/2

•EDMONDS, T.
• • •
A STUDY OF THERMAL TRANSPIRATION USINGULTRAHIGH VACUUM TECHNIQUES,
AD-629 959 FLD. 20/13

•EDWARDS, JAMES P., III
• • •
CUMBERLAND PLATEAU SEISMOLOGICALOBSERVATORY.
AD-629 553 FLD. 8/11

•EDWARDS, JAMES P., III.
• • •
MULTIPLE ARRAY PROCESSOR.
AD-629 607 FLD. 8/11

•EDWARDS, WARD
• • •
SEEKING INFORMATION TO REDUCE THE RISK OFDECISIONS,
AD-629 542 FLD. 5/10

•EGOROV, V. P.
• • •
AMMONIA MASER (AMMONIA MOLECULARGENERATOR),
AD-629 196 FLD. 20/5

•EGOROVAAND, N. B.
• • •
IMMUNOLOGICAL ACTIVITY OF LYMPHOID ORGANSDURING AEROSOL AND SUBCUTANIOUS TYPHOIDIMMUNIZATION,
AD-629 631 FLD. 6/13

•EIDUK, YU. A.
• • •
MUTUAL SOLUBILITY OF COPPER AND MOLYBDENUMAND CERTAIN PROPERTIES OF ALLOYS OF MOLYBDENUMWITH COPPER,
AD-629 908 FLD. 11/6

•EIFERT, H. C.
• • •
MEASUREMENT OF WIND SHEAR.
AD-629 339 FLD. 4/2

•EISENBERG, A.
• • •
THE VISCOELASTIC RELAXATION MECHANISM OFINORGANIC POLYMERS. IV. SIMULTANEOUSMULTIPLE MECHANISMS.
AD-629 329 FLD. 11/9
• • •
GLASS TRANSITIONS IN IONIC POLYMERS.
AD-629 330 FLD. 11/9
• • •
VISCOELASTIC RELAXATION MECHANISMS OFINORGANIC POLYMERS. V. COUNTERION EFFECTSIN BULK POLYELECTROLYTES.
AD-629 331 FLD. 11/9

•ELASHOFF, R. M.
• • •
MISSING VALUES IN MULTIVARIATE STATISTICS-I. REVIEW OF THE LITERATURE.
AD-629 269 FLD. 12/1

•ELBAUM, CHARLES
• • •
PHYSICAL RESEARCH ON PROPERTIES OF II-VICOMPOUND SEMI CONDUCTORS.
AD-629 476 FLD. 20/12

•ELBL, ALENA
• • •
INDEX CATALOGUE TO RUSSIAN, CENTRAL ANDEASTERN EUROPEAN, AND CHINESE LITERATURE INMEDICAL ENTOMOLOGY. VOLUME 9. VIRAL DISEASES,
AD-629 100 FLD. 6/3
• • •
CURRENT REFERENCES IN MEDICAL ENTOMOLOGYFROM RUSSIAN, CENTRAL AND EASTERN EUROPEANAND CHINESE LITERATURE, VOLUME 4, NO. 12,
AD-629 274 FLD. 6/3

•ELDER, R. C.
• • •
CRYSTAL STRUCTURE OF TETRAMERIC COBALT(II)ACETYLACETONATE,
AD-629 643 FLD. 7/4

•ELLIS, WILLARD
• • •
LABORATORY STUDIES ON THE EFFECTS OF LABORATORY SIMULATED EARTHQUAKE LOADINGS ONCOHESIVE SOIL STRENGTH, SAN LUIS DAM ANDCANAL--SAN LUIS UNIT CENTRAL VALLEY PROJECT,CALIFORNIA,
AD-629 993 FLD. 8/13

•ERIKSON, TED A.
• • •
FORCED VAPORIZATION OF WATER,
AD-629 963 FLD. 20/13

•ERNST, R.
• • •
TUNABLE SOLID STATE GENERATOR.
AD-629 310 FLD. 9/5

•EVANS, ARTHUR, JR.
• • •
SYNTAX ANALYSIS BY A PRODUCTION LANGUAGE.
AD-629 969 FLD. 9/2

•EVERETT, MARTIN E.
• • •
ESTABLISHMENT OF QUALITY ASSURANCEREQUIREMENTS FOR AMINOGUANIDINE BICARBONATE.
AD-629 929 FLD. 19/1

•EVSYUKOVA, G. A.
• • •
METHOD OF OBTAINING LUBRICANT FOR HOTWORKING OF METALS,
AD-629 000 FLD. 11/8

•EZAWA, HIROSHI
• • •
QUANTUM MECHANICS OF A MANY-BOSON SYSTEMAND THE REPRESENTATION OF CANONICALVARIABLES,
AD-629 971 FLD. 20/10

•FABRIZIO, RALPH A.
• • •
TRAINING REQUIREMENTS FOR POSTATTACKADAPTIVE BEHAVIOR.
AD-624 870 FLD. 15/3

•FAGER, JOHN H.
• • •
THE REACTIONS OF 2- AND 4-PICOLINE N-OXIDESWITH PHENYLACETIC ANHYDRIDE.
AD-629 035 FLD. 7/3

•FAHRENBRUCH, A. L.
• • •
EQUATION OF STATE OF SOLIDS: ALUMINUM ANDTEFLON.
AD-629 979 FLD. 20/13

•FARB, H.
• • •
GLASS TRANSITIONS IN IONIC POLYMERS.
AD-629 330 FLD. 11/9

•FARBER, M.
• • •
THERMODYNAMIC PROPERTIES OF ROCKET EXHAUSTPRODUCTS.
AD-629 598 FLD. 21/9

•FARNELL, G. W.
• • •
CONCENTRATION DEPENDENCE OF SPIN-LATTICERELAXATION TIME OF COLOR CENTERS IN QUARTZ,
AD-629 098 FLD. 20/2

•FARRELL, P. J.
• • •
CUMBERLAND PLATEAU SEISMOLOGICALOBSERVATORY.
AD-629 552 FLD. 8/11

•FARRER, DONALD N.
• • •
THE REFRACTIVE CHARACTERISTICS ANDINTRAOCULAR TENSIONS OF COLONYCHIMPANZEES,
AD-629 333 FLD. 6/3

•FATOU, J. C.
• • •
A CALORIMETRIC STUDY OF THE FUSION OFMOLECULAR WEIGHT FRACTIONS OF LINEARPOLYETHYLENE,
AD-629 177 FLD. 7/3

•FAUST, HEINRICH
• • •
THE NULL LAYER CONCEPTION IN STRATOSPHEREAND MESOSPHERE, ESPECIALLY IN SPRING ANDFALL.
AD-629 216 FLD. 4/2

•FAVA, JAMES A.
• • •
AVAILABILITY OF SCIENTIFIC JOURNALS INDEFENSE ORIENTED LIBRARIES,
AD-629 909 FLD. 5/2

•FEDDERS, GORDON T.
• • •
EVALUATION OF PROPOSED MODIFICATIONS TO THEAN/UPN-19 SERIES LORAN C RECEIVERS.
AD-629 119 FLD. 17/7

•FEDER, E. S.
• • •
METHOD OF AUTOMATIC WELDING OF STATIONARYOBJECTS WITH CLOSED LINEAR JOINTS,
AD-629 068 FLD. 13/8

•FEDOROVA, T. N.
• • •
OMSK HEMORRHAGIC FEVER INCIDENCE IN MANAND MUSKRATS IN WINTER,
AD-629 657 FLD. 6/13

•FELSEN, L. B.
• • •
MODAL ANALYSIS AND SYNTHESIS OFELECTROMAGNETIC FIELDS.
AD-629 362 FLD. 20/3

•FENN, ROBERT W.
• • •

SCATTERING PROPERTIES OF CONCENTRIC SOOTWATER SPHERES FOR VISIBLE AND INFRAREDLIGHT,
AD-629 952 FLD. 20/6

•FERNSTROM, ROBERT W., JR.
• • •
CROSS-COUNTRY SPEED AND DRIVER VIBRATIONALENVIRONMENT OF THE M60 MAIN BATTLE TANK,
AD-629 117 FLD. 5/5

•FERRISO, C. C.
• • •
EMPIRICAL INFRARED ABSORPTION COEFFICIENTSOF H2O FROM 300K TO 3000K.
AD-629 982 FLD. 21/2

•FILATOVA, M. A.
• • •
EXPERIMENT IN THE USE OF EI 893 ALLOY FORGAS-TURBINE BLADES,
AD-629 290 FLD. 21/5

•FINEMAN, M. A.
• • •
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERICGASES.
AD-629 480 FLD. 4/1

•FINLAYSON, B. A.
• • •
THE METHOD OF WEIGHTED RESIDUALS AND ITSRELATION TO CERTAIN VARIATIONAL PRINCIPLESFOR THE ANALYSIS OF TRANSPORT PROCESSES,
AD-629 551 FLD. 4/1

•FISHBURN, PETER C.
• • •
MODERN UTILITY THEORY: 1940-1970.
AD-629 047 FLD. 12/2
• • •
A GENERAL THEORY OF FINITE SEQUENTIALDECISION PROCESSES.
AD-629 048 FLD. 12/1

•FISHER, F. H.
• • •
THE EFFECT OF PRESSURE ON THE DISSOCIATIONOF MANGANESE SULFATE ION PAIRS IN WATER,
AD-629 985 FLD. 7/4

•FISHWICK, JOHN H.
• • •
RADIATION ABSORBING GLASS.
AD-629 874 FLD. 11/2

•FLEMINGS, M. C.
• • •
INVESTIGATION OF SOLIDIFICATION OF HIGHSTRENGTH STEEL CASTINGS.
AD-629 987 FLD. 11/6

•FOLEY, P. J.
• • •
BAR PRESSING BY THE RAT AS A FUNCTION OFAUDITORY STIMULATION,
AD-629 102 FLD. 5/10

•FORMAN, MIRIAM A.
• • •
NEUTRON MONITOR MASS ABSORPTION COEFFICIENTS AT CHICAGO AND CLIMAX DURING SOLARCYCLE 19 (1954-1963).
AD-629 600 FLD. 4/1

•FORSHAW, S. E.
• • •
SPEAKING AND LISTENING THROUGH THE HEAD:I. THE INTELLIGIBILITY OF SPEECH RECORDED INQUIET AT DIFFERENT POSITIONS ON THE HEAD ANDTHROAT,
AD-629 109 FLD. 17/2

•FOSTER, THEODORE D.
• • •
STABILITY OF A HOMOGENEOUS FLUID COOLEDUNIFORMLY FROM ABOVE,
AD-629 984 FLD. 20/4

•FRANCIS, G. F.
• • •
TONTO FOREST SEISMOLOGICAL OBSERVATORY.
AD-629 969 FLD. 8/11

•FREEMAN, RONALD R.
• • •
SYNTHESIS OF AMINOQUINONE POLYMERS.
AD-629 891 FLD. 11/10

•FREGLY, ALFRED R.
• • •
VISUAL LOCALIZATION OF THE HORIZONTAL ASA FUNCTION OF BODY TILT UP TO = 90 DEGREESFROM GRAVITATIONAL VERTICAL,
AD-629 266 FLD. 6/19

•FRISCH, I. T.
• • •
A UNIFIED THEORY OF SYNTHESIS WITH UNSYMMETRIC FOUR-ELEMENT LOSSLESS LATTICES,
AD-629 576 FLD. 9/5

•FRISCH, M. A.
• • •
THERMODYNAMIC PROPERTIES OF ROCKET EXHAUSTPRODUCTS.
AD-629 598 FLD. 21/9

•FRODESEN, A. G.
• • •
A FORTRAN PROGRAMME FOR THE ANALYSIS OFHYPERFRAGMENTS AND FOR OTHER EMULSIONSTUDIES,
AD-629 014 FLD. 18/8

•FU, Y.
• • •
A NOTE ON THE RELIABILITY OF COMMUNICATIONNETWORKS.
AD-629 692 FLD. 14/4

•FULLER, D. D.
• • •
EVALUATION OF FRICTION AND WEAR CHARACTERISTICS OF MATERIALS FOR GAS-LUBRICATED BEARINGS UNDER CONDITIONS OF START-STOP, ANDWHIRL INDUCED RUBBING.
AD-629 376 FLD. 13/9

•FUNGAROLI, A. A.
• • •
CONSOLIDATION DUE TO TANGENTIAL LOADS(CONSOLIDATION PRODUITE PAR DES CHARGES TANGENTIELLES),
AD-629 113 FLD. 13/13

•FURUKAWA, GEORGE T.
• • •
HEAT CAPACITY AND THERMODYNAMICPROPERTIES OF BERYLLIUM ALUMINATE(CHRYSOBERYL), BEO-A1203, FROM 16 TO 280K,
AD-629 096 FLD. 20/13

•GALADZHII, F. M.
• • •
IMPROVEMENT OF METHODS FOR MEASURINGDETONATION RATES,
AD-629 605 FLD. 14/2

•GALAN, MICHAEL
• • •
ESTABLISHMENT OF QUALITY ASSURANCEREQUIREMENTS FOR AMINOGUANIDINE BICARBONATE.
AD-629 929 FLD. 19/1

•GALEENER, F. L.
• • •
MAGNETIC PROPERTIES OF INAS DIODEELECTROLUMINESCENCE,
AD-629 878 FLD. 20/3

•GALIULLIN, A. S.
• • •
ANALYTICAL CONSTRUCTION OF THE GUIDANCESYSTEM OF ROCKETS,
AD-629 093 FLD. 16/2

•GALLAGHER, BRIAN D.
• • •
EFFECT OF TRANSISTOR DESIGN PARAMETERSON RADIATION RESPONSE (SURFACE EFFECTS).
AD-629 533 FLD. 9/1

•GAMBINO, LAWRENCE A.
• • •
RESULTS OF SPACE TRIANGULATION ADJUSTMENTSFROM SATELLITE DATA.
AD-629 298 FLD. 8/4
• • •
REDUCTION PROCEDURES FOR ABSOLUTEDIRECTION AND GEODETIC AZIMUTHS FROM OPTICALOBSERVATIONS OF SATELLITES.
AD-629 396 FLD. 8/4

•GANI, J.
• • •
ON THE INDEPENDENCE OF YEARLY WATER INPUTSIN DAMS.
AD-629 898 FLD. 8/8
• • •
ON THE GENERAL STOCHASTIC EPIDEMIC,
AD-629 899 FLD. 12/1

•GANZ, S. N.
• • •
NEW ANTIFRICTION AND CHEMICALLY STABLEMATERIALS,
AD-629 092 FLD. 11/9

•GARRETT, W. D.
• • •
THE DAMPING OF CAPILLARY WAVES AT THE AIR/WATER INTERFACE BY NATURALLY OCCURRINGSURFACE-ACTIVE MATERIAL.
AD-629 933 FLD. 20/4

•GARSCADDEN, A.
• • •
THE WAVE NATURE OF MOVING STRIATIONS,
AD-629 189 FLD. 20/9

•GARVIN, PAUL L.
• • •
COMPUTER PROCESSING AND CULTURAL DATA:PROBLEMS OF METHOD,
AD-629 369 FLD. 9/2

•GASTWIRTH, J.
• • •
THE SIGN TEST ON AUTOREGRESSIVE DATA.
AD-629 272 FLD. 12/1

•GEBHARD, R.
• • •
RESEARCH ON CONSIDERATION OF TRAININGFUNCTIONS DURING DESIGN OF OPERATIONALEQUIPMENT.
AD-629 129 FLD. 9/9

•GEFEN, N. E.
• • •
IMMUNOLOGICAL ACTIVITY OF LYMPHOID ORGANSDURING AEROSOL AND SUBCUTANIOUS TYPHOIDIMMUNIZATION,
AD-629 631 FLD. 6/13

•GELINS, EDWARD
• • •
RESEARCH ON F-VALUES: COMPREHENSIVEREPORT.
AD-629 996 FLD. 7/4

•GENTLE, KENNETH W.
• • •
LONGITUDINAL WAVES IN A WEAKLY IONIZEDGAS,
AD-629 879 FLD. 20/4

•GERTSIK, M.
• • •
METHOD OF PROTECTING THE WORKING SURFACEOF SOLAR BATTERIES,
AD-629 186 FLD. 10/2

•GETSOV, L. B.
• • •
EXPERIMENT IN THE USE OF EI 893 ALLOY FORGAS-TURBINE BLADES,
AD-629 290 FLD. 21/8

•GHAUSI, MOHAMMED S.
• • •
MICROELECTRONIC AMPLIFIERS HAVING MINIMUMSENSITIVITY TO ARBITRARY PARAMETER CHANGES,
AD-629 379 FLD. 9/1
• • •
STEADY-STATE AND TRANSIENT RESPONSE OFARBITRARY TAPERED DISTRIBUTED RC NETWORKSWITH LUMPED LOAD TERMINATIONS.
AD-629 392 FLD. 9/8

•GIBADULLIN, N. N.
• • •
METHOD OF PROTECTING THE WORKING SURFACEOF SOLAR BATTERIES,
AD-629 186 FLD. 10/2

•GIBBS, C. B.
• • •
PROBABILITY LEARNING IN STEP-INPUT TRACKING.
AD-629 109 FLD. 5/10

•GIELISSE, PETER J.
• • •
CHARACTERISTIC FREQUENCIES FROM INFRAREDAND ELASTIC DATA.
AD-629 166 FLD. 20/12

•GILMORE, JOHN T., JR.
• • •
RESEARCH ON ADVANCED DYNAMIC ATTRIBUTEEXTRACTION TECHNIQUES.
AD-629 181 FLD. 9/2

•GINSBURG, SEYMOUR
• • •
DETERMINISTIC CONTEXT FREE LANGUAGES,
AD-629 938 FLD. 9/2
• • •
ALGORITHMIC LANGUAGES PROJECT.
AD-629 940 FLD. 9/2

•GLAVIANO, VINCENT V.
• • •
MYOCARDIAL CATECHOLAMINES AND STIMULATIONOF THE STELLATE GANGLION IN HEMORRHAGICSHOCK,
AD-629 279 FLD. 6/5

•GLAZUNOV, P. YA.
• • •
THE SYNTHESIS OF A SEMI-CONDUCTING COMBINATION OF MATERIALS BY THE METHOD OF RADIATIONOF GASEOUS PHASE INFUSED POLYMERIZATION,
AD-629 912 FLD. 11/9

•GLOVER, DALE P.
• • •
CUMBERLAND PLATEAU SEISMOLOGICALOBSERVATORY.
AD-629 953 FLD. 8/11

•GLOWACKI, A. S.
• • •
PROTECTIVE COATINGS FOR DEEP SUBMERGENCEVESSELS.
AD-629 896 FLD. 11/9

•GODDARD, RICHARD T.
• • •
OBSERVED SUPERSATURATION IN THE ARL 20-INCHHYPERSONIC WIND TUNNEL.
AD-629 293 FLD. 14/2

•GOFFMAN, W.
• • •
USE OF META-LANGUAGE IN INFORMATIONRETRIEVAL SYSTEMS,
AD-629 977 FLD. 9/2

•GOLDSTEIN, S. E.
• • •
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-629 889 FLD. 13/7

•GOLEMBESKI, JOHN J.
• • •
MICROELECTRONIC AMPLIFIERS HAVING MINIMUMSENSITIVITY TO ARBITRARY PARAMETER CHANGES,
AD-629 379 FLD. 9/1

•GOLUBOVIC, ALEKSANDAR
• • •
SUBSTITUTED PERINAPHTHENYL ANION RADICALS.
AD-629 121 FLD. 7/3

•GOODE, R. J.
• • •
METALLURGICAL CHARACTERISTICS OF HIGHSTRENGTH STRUCTURAL MATERIALS.
AD-629 374 FLD. 11/6

•GOODGAME, D. M. L.
• • •
INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARYARSINE OXIDES,
AD-629 696 FLD. 7/4

•GOODINGS, D. A.
• • •
INTERPRETATION OF THE SOFT X-RAY EMISSIONSPECTRUM OF LITHIUM METAL,
AD-629 946 FLD. 20/2

•GORDEIEV, V. E.
• • •
ON DETONATION COMBUSTION OF HETEROGENEOUSSYSTEMS,
AD-629 198 FLD. 19/4

•GORDON, L. I.
• • •
ISOTOPIC OCEANOGRAPHY: DEUTERIUM ANDOXYGEN 18 VARIATIONS IN THE OCEAN AND THEMARINE ATMOSPHERE,
AD-629 490 FLD. 8/10

•GORSUCH, L.
• • •
PROCEEDINGS OF THE SYMPOSIUM ON COMPUTERCENTERED DATA BASE SYSTEMS (2ND).
AD-629 417 FLD. 9/2

•GOSCH, W. D.
• • •
THERMAL PROTECTION FOR LIQUID-HYDROGENFUEL TANKS IN HIGH-SPEED, LONG-RANGEAIRCRAFT,
AD-629 907 FLD. 21/4

•GOTTSCHALK, JUDITH
• • •
SPATIAL ORGANIZATION OF CHILDREN'SRESPONSES TO A PICTORIAL DISPLAY,
AD-629 107 FLD. 5/10

•GOWDEY, CHARLES W.
• • •
BRAIN LESIONS AND HYPERBARIC OXYGENCONVULSIONS,
AD-629 527 FLD. 6/5

•GRADIJAN, J. M.
• • •
RESEARCH ON CONSIDERATION OF TRAININGFUNCTIONS DURING DESIGN OF OPERATIONALEQUIPMENT.
AD-629 129 FLD. 5/9

•GRAYBIEL, ASHTON
• • •
VISUAL LOCALIZATION OF THE HORIZONTAL ASA FUNCTION OF BODY TILT UP TO = 90 DEGREESFROM GRAVITATIONAL VERTICAL,
AD-629 266 FLD. 6/19
• • •
OTOLITH ORGAN ACTIVITY WITHIN EARTHSTANDARD, ONE-HALF STANDARD, AND ZERO GRAVITYENVIRONMENTS.
AD-629 323 FLD. 6/19

•GREATOREX, FRANK S., JR.
• • •
RESEARCH ON ADVANCED DYNAMIC ATTRIBUTEEXTRACTION TECHNIQUES.
AD-629 181 FLD. 9/2

•GREBENIK, V. M.
• • •
EXPERIMENTAL INVESTIGATION OF THE INFLUENCEOF LOAD ALTERNATION ON THE FATIGUE STRENGTHAND LONGEVITY OF COMPONENTS WITH AND WITHOUT STRESS CONCENTATION. COMMUNICATION II,
AD-629 147 FLD. 20/11

•GREBTSEV, N. V.
• • •
RECRYSTALLIZATION OF HIGH-MELTING METALSIN WELDING AND SOLDERING,
AD-629 909 FLD. 13/8

•GREEN, H. S.
• • •
DIFFUSION AND CONDUCTIVITY OF PLASMAS INSTRONG EXTERNAL FIELDS,
AD-629 998 FLD. 20/9

•GREENBAUM, M. A.
• • •
THERMODYNAMIC PROPERTIES OF ROCKET EXHAUSTPRODUCTS.
AD-629 598 FLD. 21/9

•GREENBERG, O. W.
• • •
SELECTION RULES FOR PARAFIELDS AND THEABSENCE OF PARA PARTICLES IN NATURE.
AD-629 572 FLD. 20/10

•GREENBERG, R. A.
• • •
DETERMINATION OF EQUIVALENCE BETWEENRADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CURED MEATS.
AD-629 252 FLD. 6/8

•GREENE, BETTYE W.
• • •
DETERMINATION OF PARTICLE SIZEDISTRIBUTIONS IN EMULSIONS By LIGHTSCATTERING.
AD-629 590 FLD. 7/4

•GREENE, N. D.
• • •
THERMAL AND ELECTRICAL CONDUCTIVITIES OFBIOLOGICAL FLUIDS AND TISSUES.
AD-629 897 FLD. 6/3

•GREER, PAUL
• • •
PRODUCTION ENGINEERING MEASURE FOR SILICONOVERLAY TRANSISTORS.
AD-629 317 FLD. 9/1

•GREIBACH, SHEILA
• • •
DETERMINISTIC CONTEXT FREE LANGUAGES,
AD-629 938 FLD. 9/2

•GRINDLAY, J.
• • •
ON THE LINEAR DIELECTRIC PROPERTIES OFFINITE IONIC CRYSTALS,

AD-629 961 FLD. 20/2

•GRISHIN, V. L.
• • •
SPECIFIC FEATURES IN SOLDERING COPPER WITHGALLIUM-BASE SOLDERS,
AD-629 145 FLD. 13/8

•GRISHINA, O. S.
• • •
STUDY OF THE ABILITY OF ENTERIC BACTERIATO INFECT THE AIR OF HOSPITAL WARDS,
AD-629 628 FLD. 6/13

•GROSSE, A. V.
• • •
PLASMA JET CHEMISTRY.
AD-629 591 FLD. 20/9

•GSCHWINDAND, ROBERT T.
• • •
CROSS-COUNTRY SPEED AND DRIVER VIBRATIONALENVIRONMENT OF THE M60 MAIN B/T LE TANK,
AD-629 117 FLD. 5/5

•GUBINA, E. A.
• • •
A STUDY OF IMMUNOGENESIS FOLLOWINGVACCINATION WITH THE LIVE ASSOCIATED VACCINE.REPORT I. A STUDY OF IMMUNOGENESIS IN GUINEAPIGS VACCINATED WITH BRUCELLOSIS AND ANTHRAXVACCINE,
AD-629 651 FLD. 6/13

•GUENNEGUES, J. Y.
• • •
THE RICCATI EQUATION AND REGGE POLES,
AD-629 355 FLD. 12/1

•GULLAHORN, JEANNE E.
• • •
COMPUTER SIMULATION OF ROLE CONFLICTRESOLUTION,
AD-629 941 FLD. 5/9

•GULLAHORN, JOHN T.
• • •
COMPUTER SIMULATION OF ROLE CONFLICTRESOLUTION,
AD-629 941 FLD. 5/9

•GUNTON, R. C.
• • •
ELECTRON-ION RECOMBINATION IN NITRICOXIDE IN THE TEMPERATURE RANGE 196 TO 398K,
AD-629 110 FLD. 7/4

•GUPTA, B. L.
• • •
MEASUREMENT TECHNIQUES FOR OVERSIZEDWAVEGUIDE.
AD-629 952 FLD. 9/1

•GURBAXANI, SHYAM H.
• • •
RELAXATION OF DILUTED NICKEL FLUOSILICATEAT LOW TEMPERATURES BY STEADY-STATERESONANCE ABSORPTION TECHNIQUES.
AD-629 949 FLD. 20/12

•GUTTMAN, IRWIN
• • •
THE USE OF THE CONCEPT OF A FUTURE OBSERVATION IN GOODNESS OF FET PROBLEMS.
AD-629 270 FLD. 12/1

•GUZ, A. N.
• • •
STRESSED STATE AROUND A CIRCULAR HOLE IN ASHELL OF REVOLUTION WITH A SHALLOW MERIDIANARC,
AD-629 076 FLD. 20/11

•HADLER, JACQUES B.
• • •
WAKE ANALYSIS OF SHIP MODELSI SINGLE-SCREWMERCHANT-TYPE,
AD-629 327 FLD. 13/10

•HAGAN, J. D.
• • •
PRODUCTION ENGINEERING MEASURE FOR TYPEFW-202 BARRIER GRID STORAGE TUBE.
AD-629 190 FLD. 9/1

•HAIST, R. E.
• • •
THE EFFECT OF TOLBUTAMIDE (RASTINON) ONTHE LEVELS OF GLUCOSE AND INORGANIC PHOSPHORUS OF BLOOD IN NORMOTHERMIC AND HYPOTHERMIC RATS,
AD-629 508 FLD. 6/19

•HALL, L.
• • •
POINT DEFECTS IN MAGNESIUM OXIDE,
AD-629 550 FLD. 20/12

•HALL, L. A.
• • •
SOLAR XUV SPECTRUM OF MARCH, 1964.
AD-629 131 FLD. 3/2

•HAMMER, CHARLES H.
• • •
TIMELINESS AND ACCURACY IN A SEQUENTIALDECISION MAKING TASK.
AD-629 223 FLD. 5/9

•HAMPTON, K. GERALD
• • •
TETRASODIO BIS-BETA-DIKETONES.DICONDENSATIONS WITH ELECTROPHILICCOMPOUNDS,
AD-629 639 FLD. 7/3

•HANLON, T. L.
• • •
IONIC COPOLYMERIZATION OF STYRENE ANDP-METHYL-STYRENE.
AD-629 541 FLD. 11/9

•HANSON, HOWARD G.
• • •
OCTOBER 1968 STATUS REPORT,
AD-629 024 FLD. 7/4

•HARRIS, D.
• • •
INTENTIONAL COMBUSTION OSCILLATIONS INPROPULSION SYSTEMS.
AD-629 499 FLD. 21/8

•HARRIS, FRANK E.
• • •
THE INTERACTION POTENTIAL SURFACE FOR H3.
AD-629 214 FLD. 7/4

•HARRIS, ROBERT S.
• • •
DEFINITION AND OBJECTIVES OF THE CONFERENCEON PHOSPHATES AND DENTAL CARIES,
AD-629 526 FLD. 6/5

•HARRIS, RUSSELL G.
• • •
TERMINAL WEATHER PREDICTION TECHNIQUES.
AD-629 094 FLD. 4/2

•HART, J. S.
• • •
SEASONAL ACCLIMATIZATION IN VARYING HARE(LEPUS AMERICANUS),
AD-629 996 FLD. 6/3

•HARTNER, A. J.
• • •
FUEL CELL CATALYSTS.
AD-629 127 FLD. 10/2

•HARVEY, O. J.
• • •
A COGNITIVE DETERMINANT OF IMPRESSIONFORMATION.
AD-629 019 FLD. 5/10

•HAUSER, CHARLES R.
• • •
ALKYLATIONS OF PHENYLACETIC, ALPHAALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERSBY MEANS OF SODAMIDE AND SODIUM HYDRIDE,
AD-629 634 FLD. 7/3
• • •
TETRASODIO BIS-BETA-DIKETONES.DICONDENSATIONS WITH ELECTROPHILICCOMPOUNDS,
AD-629 639 FLD. 7/3

•HAYASHI, HIDEO
• • •
BIOLOGICAL SIGNIFICANCE OF A PROTEASEINHIBITOR NEWLY ISOLATED FROM ANIMAL TISSUESIN INFLAMMATION.
AD-624 889 FLD. 6/1

•HEGGIE, R. H.
• • •
PENETRATION OF GUINEA PIG AND RABBIT SKINBY DIMETHYL SULFOXIDE SOLUTIONS OF AQUATERNARY OXIME,
AD-629 435 FLD. 6/19

•HEIL, H.
• • •
THE CESIUM IONIZATION CROSS SECTION FROMTHRESHOLD TO 90 EV.,
AD-629 951 FLD. 7/4

•HELLMAN, W. S.
• • •
A NOTE ON FIELD THEORIES WITHOUT MASSRENORMALIZATION,
AD-629 959 FLD. 20/8

•HELM, CARL E.
• • •
SIMULATION MODELS FOR PSYCHOMETRIC THEORIES,
AD-629 474 FLD. 5/10

•HERNDON, CHARLES L.
• • •
LOCOMOTION OF OCEAN BOTTOM VEHICLE BYSHIFTING BALLAST.
AD-629 321 FLD. 13/10

•HEROUX, L.
• • •
SOLAR XUV SPECTRUM OF MARCH, 1964.
AD-629 131 FLD. 3/2

•HERRICK, ROBERT M.
• • •
RESPONSE DURATION AND INTERRESPONSE TIMEUNDER FR9 AND VR9 SCHEDULES AND SUBSEQUENTEXTINCTION,
AD-629 324 FLD. 5/10

•HIGGINS, THOMAS JEROME, III.
• • •
THE RESPONSE OF A BEAM TO AN IMPACT LOADING.
AD-629 991 FLD. 20/11

•HIGGINS, V. J.
• • •
MICROWAVE GENERATION FROM AVALANCHINGVARACTOR DIODES,
AD-629 996 FLD. 9/5

•HIGGS, WILLIAM J.
• • •
SOCIAL MOTIVES AND DECISION-MAKINGBEHAVIOR IN INTERPERSONAL SITUATIONS.
AD-629 987 FLD. 5/10

•HIGLEY, HENRY G.
• • •
UNITERMS AND THE LEARNING CURVE,

AD-629 027 FLD. 9/2

•HILLS, THEO. L.
• • •
DIRECTORY OF INSTITUTIONS PRIMARILY DEVOTEDTO HUMID TROPICS RESEARCH,
AD-629 927 FLD. 8/6

•HILTNER, W. A.
• • •
SPECTRAL CLASSIFICATION AND SPECTROSCOPICSTUDIES.
AD-629 993 FLD. 3/2

•HINKLE, J. G.
• • •
EVALUATION OF FRICTION AND WEAR CHARACTERISTICS OF MATERIALS FOR GAS-LUBRICATED BEARINGS UNDER CONDITIONS OF START-STOP, ANDWHIRL INDUCED RUBBING.
AD-629 376 FLD. 13/9

•HINTEREGGER, H. E.
• • •
ABSOLUTE INTENSITY MEASUREMENTS IN THEEXTREME ULTRAVIOLET SPECTRUM OF SOLARRADIATION.
AD-629 129 FLD. 20/6
• • •
SOLAR XUV SPECTRUM OF MARCH, 1969.
AD-629 131 FLD. 3/2

•HINTEREGGER, HANS. E.
• • •
ROCKET SPECTRA OF THE CHROMOSPHERE.
AD-629 139 FLD. 3/2

•HO, C. W.
• • •
A UNIFIED THEORY OF SYNTHESIS WITH UNSYMMETRIC FOUR-ELEMENT LOSSLESS LATTICES,
AD-629 576 FLD. 9/5

•HOBSON, J. A.
• • •
L'ACTIVITE ELECTRIQUE PHASIQUE DU CORTEX ETDU THALAMUS AU COURS DU SOMMEIL DESYNCHRONISE CHEZ LE CHAT (PHASIC ELECTRICAL ACTIVITY OF THECORTEX AND OF THE THALAMUS DURING DESYNCHRONIZED SLEEPOF THE CAT),
AD-629 342 FLD. 6/16

•HOBSON, J. P.
• • •
A STUDY OF THERMAL TRANSPIRATION USINGULTRAHIGH VACUUM TECHNIQUES,
AD-629 959 FLD. 20/13
• • •
A NEW METHOD FOR FINDING HETEROGENEOUSENERGY DISTRIBUTIONS FROM PHYSICALADSORPTION ISOTHERMS,
AD-629 972 FLD. 7/4
• • •
ANALYSIS OF PHYSICAL ADSORPTION ISOTHERMSON HETEROGENEOUS SURFACES AT VERY LOWPRESSURES,
AD-629 973 FLD. 7/4

•HOEHN, A. J.
• • •
FREQUENCY ASSIGNMENT STUDIES.
AD-629 985 FLD. 17/2.1

•HOFACKER, G. LUDWIG
• • •
THEORY OF INTERNAL RELAXATION IN CHEMICALKINETICS,
AD-629 377 FLD. 7/4

•HOFF, NICHOLAS J.
• • •
THE SNAP-THROUGH AND POSTBUCKLINGEQUILIBRIUM BEHAVIOR OF CIRCULAR CYLINDRICALSHELLS UNDER AXIAL LOAD,
AD-629 279 FLD. 20/11
• • •
ELASTIC-PLASTIC ANALYSIS OF THE COLLAPSEOF UNIFORMLY COMPRESSED CIRCULAR CYLINDRICALSHELLS,
AD-629 276 FLD. 20/11

•HOFFMAN, C. R.
• • •
ICE CONSTRUCTION-PROTOTYPE SUBMERSIBLEELECTRIC PUMP AND EXTENSION TUBE.
AD-629 320 FLD. 13/11

•HOFFMAN, DAVID K.
• • •
QUANTUM-MECHANICAL BOLTZMANN EQUATION,
AD-629 881 FLD. 20/10

•HOFFMAN, JOHN
• • •
ARRAY RESEARCH.
AD-629 556 FLD. 8/11

•HOFLAND, J.
• • •
NUCLEAR SPIN RELAXATION IN PI-TYPE INSB ATLIQUID-HELIUM TEMPERATURES,
AD-629 978 FLD. 20/12

•HOFSTETTER, EDWARD M.
• • •
SOME RESULTS ON THE STOCHASTIC SIGNALPARAMETER ESTIMATION PROBLEM.
AD-629 866 FLD. 9/4

•HOLCOMB, D. F.
• • •
RESEARCH ON SOFT X-RAY ABSORPTION.
AD-629 219 FLD. 20/12

•HOLLINS, CLINTON G.
• • •
A LARGE, LOW-COST STEERABLE PLANAR ARRAY.
AD-629 880 FLD. 9/5

•HOLMAN, WAYNE J., III.
• • •
MODIFIED ISOBAR APPROXIMATION FOR PI-RHOSCATTERING,
AD-629 950 FLD. 20/8

•HONIG, A.
• • •
NUCLEAR SPIN RELAXATION IN PI-TYPE INSB ATLIQUID-HELIUM TEMPERATURES,
AD-629 978 FLD. 20/12

•HONNOLD, VINCENT R.
• • •
EFFECT OF TRANSISTOR DESIGN PARAMETERSON RADIATION RESPONSE (SURFACE EFFECTS).
AD-629 933 FLD. 9/1

•HORLEY, GARY L.
• • •
CROSS-COUNTRY SPEED AND DRIVER VIBRATIONALENVIRONMENT OF THE M60 MAIN BATTLE TANK,
AD-629 117 FLD. 5/5

•HOSHOVSKY, A. G.
• • •
TOWARD A NATIONAL TECHNICAL INFORMATIONSYSTEM,
AD-629 996 FLD. 5/2

•HOSHOVSKY, ALEXANDER G.
• • •
AVAILABILITY OF SCIENTIFIC JOURNALS INDEFENSE ORIENTED LIBRARIES,
AD-629 909 FLD. 5/2

•HOSKINS, R. H.
• • •
LASER-PUMPED LASER.
AD-629 938 FLD. 20/5

•HOWARD, J. A.
• • •
THE KINETICS OF THE INHIBITED AUTOXIDATIONOF TETRALIN. II,
AD-629 963 FLD. 7/4
• • •
ABSOLUTE RATE CONSTANTS FOR HYDROCARBONAUTOXIDATION. II. DEUTERO STYRENES AND RINGSUBSTITUTED STYRENES,
AD-629 969 FLD. 7/4

•HOWE, D. G.
• • •
METALLURGICAL CHARACTERISTICS OF HIGHSTRENGTH STRUCTURAL MATERIALS.
AD-629 379 FLD. 11/6

•HRUBECKY, HENRY F.
• • •
A FLOW MODEL AND ANALYSIS OF A ROCKET PAIRIN CLOSE PROXIMITY,
AD-629 966 FLD. 19/4

•HSIA, HAN MIN
• • •
RADIATIVE HEAT TRANSFER BETWEEN PARALLELPLATES SEPARATED BY A NON-ISOTHERMALMEDIUM ANISOTROPIC SCATTERING.
AD-629 209 FLD. 20/13

•HUANG, JEANETTE TUNG-HSIANG
• • •
HAEMOGLOBIN E IN VIETNAMESE.
AD-629 111 FLD. 6/5

•HUBER, R. W.
• • •
METALLURGICAL CHARACTERISTICS OF HIGHSTRENGTH STRUCTURAL MATERIALS.
AD-629 374 FLD. 11/6

•HUEBNER, A. L.
• • •
RESPONSE OF A BURNING SOLID PROPELLANT TOPRESSURE WAVES OF FINITE AMPLITUDE.
AD-629 949 FLD. 21/9

•HUFF, JOHN N.
• • •
IMPLEMENTATION OF RECURSIVE PROCEDURES ONTHE IBM 7080 COMPUTER USING THE 7098 FORTRANPROCESSOR.
AD-629 322 FLD. 12/1

•HUNT, M. R.
• • •
THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM,
AD-629 967 FLD. 11/6

•HUSSEY, R. G.
• • •
EFFECT OF A CYLINDRICAL BOUNDARY ON THEADDED MASS OF TWO CYLINDERS IN LIQUID HELIUM,
AD-629 656 FLD. 20/4

•IKEDA, YOSHITAKA
• • •
ANODE STRUCTURES FOR COLD-CATHODE HIGHPOWER MAGNETRONS.
AD-629 983 FLD. 9/1

•ILCHENKO, O. T.
• • •
THERMAL RESISTANCE OF TAIL CONNECTIONS OFTURBINE BLADES,
AD-629 242 FLD. 21/5

•ILENKO, V. S.
• • •
A SYMMETRICAL FLIPFLOP,
AD-629 063 FLD. 9/5

•ILIN, V. V.
• • •
AMMONIA MASER (AMMONIA MOLECULARGENERATOR),
AD-629 196 FLD. 20/5

•ILLINGER, KARL H.
• • •
DIELECTRIC DISPERSION.
AD-629 609 FLD. 7/4

•ILYIN, L. O.
• • •
DIFFERENTIAL EQUATIONS OF ELASTIC EQUILIBRIUMOF SHELLS OF ROTATION WITH MERIDIONAL RIBS ATPOWER AND TEMPERATURE LOADS,
AD-629 162 FLD. 20/11

•ILYINA, V. P.
• • •
LIQUID-VAPOR PHASE EQUILIBRIUM OF ALCOHOL WATER MIXTURES IN THE PRESENCE OF CERTAINSALTS, AT ATMOSPHERIC PRESSURE,
AD-629 931 FLD. 7/4

•INGARD, UNO
• • •
LONGITUDINAL WAVES IN A WEAKLY IONIZEDGAS,
AD-624 879 FLD. 20/9

•INGOLD, K. U.
• • •
THE KINETICS OF THE INHIBITED AUTOXIDATIONOF TETRALIN. II,
AD-624 963 FLD. 7/4
• • •
ABSOLUTE RATE CONSTANTS FOR HYDROCARBONAUTOXIDATION. II. DEUTERO STYRENES AND RINGSUBSTITUTED STYRENES,
AD-624 964 FLD. 7/4

•IVANOVA, L. G.
• • •
NITROGENOUS SUBSTANCE CHANGES IN THENUTRITIVE BROTHS PREPARED FROM THE DRYKPD PREPARATION FOLLOWING CULTURING OF CL.BOTULINUM OF THE A, B, C AND E TYPES,
AD-629 617 FLD. 6/13

•IVANSHENTSEV, N.
• • •
PROTECTION FROM MASS-DESTRUCTION WEAPONS,
AD-629 192 FLD. 5/9

•JAKOBSEN, R. J.
• • •
AN INFRARED STUDY OF POLYFLUORINATEDAROMATICS IN THE LOW-FREQUENCY REGION.
AD-629 129 FLD. 7/3

•JALICS, GEORGE
• • •
THE DECOMPOSITION OF SILYL HYDROPEROXIDES,
AD-629 698 FLD. 7/3

•JANZ, GEORGE J.
• • •
VISCOSITY MEASUREMENTS OF IONIC MELTS ATTEMPERATURES TO 1100C.
AD-629 936 FLD. 7/4

•JEANTHEAU, GABRIEL G.
• • •
SYSTEMS ANALYSIS OF AAW TRAINING REQUIREMENTS.
AD-629 378 FLD. 5/9

•JOHNSON, ALBERT D.
• • •
EFFECTS OF EXPERIMENTAL PARAMETERS ONTHERMOLUMINESCENCE OF A TYPE II-A DIAMOND.
AD-629 169 FLD. 20/12

•JOHNSON, DUANE M.
• • •
THE PRODUCTION OF VISIBLE LIGHT BY THETHORIA-CERIA MANTLE: PHYSICAL CHARACTERISTICSAND A PROPOSED THEORY OF THE OCCURINGMECHANISMS AND PROCESSES,
AD-629 008 FLD. 7/4

•JOHNSON, LELAND L.
• • •
ECONOMIC PROBLEMS OF ESTABLISHING ACOMMUNICATIONS SATELLITE SYSTEM,
AD-629 381 FLD. 5/3

•JOHNSON, W. A.
• • •
AN ANALYTICAL STUDY OF V/STOL HANDLINGQUALITIES IN HOVER AND TRANSITION.
AD-629 599 FLD. 1/2

•JONES, F. S.
• • •
CLASSIFICATION OF SOLAR PROMINENCES FORSUNSPOT CYCLE NO. 19 - 1962.
AD-629 381 FLD. 3/2

•JONES, M. V.
• • •
SYSTEM COST ANALYSIS: A MANAGEMENT TOOL FORDECISION MAKING,
AD-624 893 FLD. 5/3

•JORDAN, E. D.
• • •
VARIABLE INTENSITY ISOTOPIC SOURCES.
AD-629 419 FLD. 18/2

•JOUVET, M.
• • •
L'ACTIVITE ELECTRIQUE PHASIQUE DU CORTEX ETDU THALAMUS AU COURS DU SOMMEIL DESYNCHRONISE CHEZ LE CHAT (PHASIC ELECTRICAL ACTIVITY OF THECORTEX AND OF THE THALAMUS DURING DESYNCHRONIZED SLEEPOF THE CAT),
AD-629 342 FLD. 6/16

•JULIAN, JAMES W.
• • •
INTERACTION PROCESS AND TASK OUTCOME INEXPERIMENTALLY-CREATED NEGOTIATION GROUPS.
AD-629 988 FLD. 5/10

•JUNKER, VIRGIL J.
• • •
THE EVOLUTION OF USAF ENVIRONMENTAL TESTING.
AD-629 943 FLD. 14/2

•JUSTIN, J.
• • •
A CALORIMETRIC STUDY OF THE FUSION OFMOLECULAR WEIGHT FRACTIONS OF LINEARPOLYETHYLENE,
AD-629 177 FLD. 7/3

•KABRE, KISHAN R.
• • •
THE SYNTHESIS AND REACTIONS OF BISDIPHENYLPHOSPHINIC PEROXIDE,
AD-629 690 FLD. 7/3

•KAGANOV, S. A.
• • •
THE TRANSIENT THEORY OF THERMALSELF-IGNITION,
AD-629 191 FLD. 21/2

•KAISER, EDWIN W.
• • •
ALKYLATIONS OF PHENYLACETIC, ALPHAALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERSBY MEANS OF SODAMIDE AND SODIUM HYDRIDE,
AD-629 634 FLD. 7/3

•KALINKINA, Z. M.
• • •
METHOD OF OBTAINING LUBRICANT FOR HOTWORKING OF METALS,
AD-629 000 FLD. 11/8

•KANATOV, YU. V.
• • •
A NEW VARIETY OF PLAGUE MICROBE,
AD-629 630 FLD. 6/13

•KANEVSKII, M. M.
• • •
EXTERNAL STORAGE FOR COMPUTERS,
AD-629 299 FLD. 9/2

•KAPINOS, V. M.
• • •
THERMAL RESISTANCE OF TAIL CONNECTIONS OFTURBINE BLADES,
AD-629 242 FLD. 21/5

•KAPLAN, S. A.
• • •
STRUCTURAL, CORRELATION, AND SPECTRALFUNCTIONS OF INTERSTELLAR GAS TURBULENCE,
AD-624 914 FLD. 3/2

•KAPRIELIAN, Z. A.
• • •
CONSOLIDATED SEMIANNUAL PROGRESS REPORTNO. 2, 1 APRIL 1969 THROUGH 30 SEPTEMBER 1969,
AD-629 471 FLD. 20/12

•KARSTENSEN, F.
• • •
NEW METHOD OF MEASURING TRANSITIONPROBABILITIES.
AD-629 595 FLD. 7/4

•KATKOVA, N. V.
• • •
METHOD OF COLLECTING INFORMATION IN ALONG TERM MEMORY DEVICE,
AD-629 240 FLD. 9/2

•KATLER, S. M.
• • •
METHOD OF AUTOMATIC WELDING OF STATIONARYOBJECTS WITH CLOSED LINEAR JOINTS,
AD-629 068 FLD. 13/8

•KATS, L. N.
• • •
ANTIGENIC STRUCTURE OF THE BAC. ANTHRACISVACCINAL STRAIN.
AD-629 645 FLD. 6/13

•KAUFMAN, J. G.
• • •
FRACTURE TOUGHNESS, FATIGUE-CRACKPROPAGATION AND CORROSION CHARACTERISTICS OFALUMINUM ALLOY PLATES FOR WING SKINS.
AD-629 484 FLD. 11/6

•KAZMINA, E. A.
• • •
ADDITIVE TO SULFUROUS FUELS FOR HIGH-SPEEDDIESEL ENGINES,
AD-629 246 FLD. 21/4

•KEANE, L. M.
• • •
THE AFCRL 29-FT MILLIMETER-WAVE ANTENNA.
AD-629 170 FLD. 9/5

•KEENAN, JAMES J.
• • •
CONCEPTS AND PRACTICES IN THE ASSESSMENTOF HUMAN PERFORMANCE IN AIR FORCE SYSTEMS.
AD-629 041 FLD. 5/10

•KEINIG, ALLEN D.
• • •
PROJECT SOUTHERN CROSS (NAVAL SHIPS ADVANCED COMMUNICATION SYSTEMS),
AD-629 099 FLD. 17/2.1

•KELLER, BENJAMIN
• • •
TOWARD AN INFORMAL AND

CREATIVECONFERENCE METHOD,
AD-629 234 FLD. 5/11

•KELLOGG, ROBERT S.
• • •
OTOLITH ORGAN ACTIVITY WITHIN EARTHSTANDARD, ONE-HALF STANDARD, AND ZERO GRAVITYENVIRONMENTS.
AD-629 323 FLD. 6/19

•KELLOGG, W. W.
• • •
SYMPOSIUM ON METEOROLOGICAL ROCKETS,
AD-629 384 FLD. 14/2

•KELLY, JOHN J.
• • •
STEADY-STATE AND TRANSIENT RESPONSE OFARBITRARY TAPERED DISTRIBUTED RC NETWORKSWITH LUMPED LOAD TERMINATIONS.
AD-629 392 FLD. 9/5

•KENNEDY, J. C.
• • •
RADIOSENSITIVITY OF THE IMMUNE RESPONSE TOSHEEP RED CELLS IN THE MOUSE, AS MEASURED BYTHE HEMOLYTIC PLAQUE METHOD,
AD-629 902 FLD. 6/18

•KENYON, WILLIAM G.
• • •
ALKYLATIONS OF PHENYLACETIC, ALPHAALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERSBY MEANS OF SODAMIDE AND SODIUM HYDRIDE,
AD-629 634 FLD. 7/3

•KERR, J. RICHARD
• • •
MICROWAVE OPTICAL RECEIVER TECHNIQUES.
AD-629 382 FLD. 17/2

•KERTESZ, Z. I.
• • •
A STUDY OF THE RADIATION-INDUCED SOFTENINGOF PLANT TISSUES.
AD-629 983 FLD. 6/8

•KHANDELWAL, D. D.
• • •
RESEARCH ON CROSSED-FIELD ELECTRONDEVICES.
AD-629 438 FLD. 9/1

•KHARA, I. S.
• • •
A METHOD OF APPROXIMATE CONFORMAL MAPPING OF POLYGONAL REGIONS ONTO A UNIT CIRCLE,
AD-629 309 FLD. 12/1

•KHATKEVICH, A. G.
• • •
ON THE THEORY OF THE CONVERSION OF THEFREQUENCY OF LIGHT WAVES BY A CRYSTAL,
AD-629 911 FLD. 20/6

•KIRBY, MICHAEL J. L.
• • •
APPLICATION OF CHANCE-CONSTRAINED PROGRAMMING TO SOLUTION OF THE SO-CALLED 'SAVINGSAND LOAN ASSOCIATION' TYPE OF PROBLEM,
AD-629 090 FLD. 12/2

•KIRK, PHILIP
• • •
EXPERIMENTAL AND ANALYTICAL STUDIES INCONTINUUM HYPERSONIC FLOW.
AD-629 209 FLD. 20/4

•KISHKIN, S. T.
• • •
PROBLEM OF THE BEHAVIOR OF HEAT RESISTANTALLOYS IN CONTACT WITH SODIUM IN STRESSEDSTATE,
AD-629 198 FLD. 11/6
• • •
STRUCTURAL IMPERFECTIONS OF METALS DURINGRECRYSTALLIZATION;
AD-629 154 FLD. 11/6

•KITTS, WILLIAM W.
• • •
METHOD FOR ESTIMATING THE CATAPULTPERFORMANCE OF A CARRIER-BASED AIRPLANE.
AD-629 930 FLD. 1/3

•KLASKY, P. S.
• • •
TONTO FOREST SEISMOLOGICAL OBSERVATORY.
AD-629 969 FLD. 8/11

•KLEBANOV, G. N.
• • •
RECRYSTALLIZATION OF HIGH-MELTING METALSIN WELDING AND SOLDERING,
AD-629 909 FLD. 13/8

•KLOUDA, MARY ANN
• • •
MYOCARDIAL CATECHOLAMINES AND STIMULATIONOF THE STELLATE GANGLION IN HEMORRHAGICSHOCK,
AD-629 279 FLD. 6/5

•KLUMPP, R. G.
• • •
SPEECH INTERFERENCE ASPECTS OF NAVYNOISES. CALCULATIONS SHOW SPEECH INTERFERENCE MEASUREMENTS ARE SIMPLIFIED BYAVERAGING SOUND PRESSURE LEVELS IN MIDFREQUENCY OCTAVES.
AD-629 262 FLD. 5/5

•KNOX, B. E.
• • •
DETERMINATION OF THE DECOMPOSITION KINETICSOF HYDRAZINE USING A SINGLE-PULSE SHOCK TUBE,
AD-629 179 FLD. 7/4

•KNUDSEN, HAROLD K.
• • •
THE SCALING OF DIGITAL DIFFERENTIALANALYZERS.
AD-629 021 FLD. 9/2

•KNUTH, DONALD F.
• • •
THE PHYSICS AND SHIELDING ASPECTS OFHETEROGENEOUS ISOTOPIC NEUTRON SOURCES,
AD-629 906 FLD. 18/2

•KO, H. C.
• • •
THERMODYNAMIC PROPERTIES OF ROCKET EXHAUSTPRODUCTS.
AD-629 598 FLD. 21/9

•KOBE, DONALD H.
• • •
COUPLING BETWEEN THE ENERGY GAP ANDSINGLE PARTICLE ENERGY FOR NUCLEAR MATTER,
AD-629 398 FLD. 20/8

•KOCHANOVKII, N. YA.
• • •
METHOD OF AUTOMATIC WELDING OF STATIONARYOBJECTS WITH CLOSED LINEAR JOINTS,
AD-629 068 FLD. 13/8

•KOEHLER, J. S.
• • •
NONEQUILIBRIUM SITUATIONS INVOLVINGVACANCIES IN GOLD,
AD-629 877 FLD. 20/2

•KOGAN, L. M.
• • •
ANTIWEAR ADDITIVE FOR LUBRICATING OILS,
AD-629 093 FLD. 11/8

•KOHN, W.
• • •
ONE-PARTICLE PROPERTIES OF AN INHOMOGENEOUS INTERACTING ELECTRON GAS.
AD-629 343 FLD. 7/4

•KOLBIG, K. S.
• • •
A FORTRAN PROGRAMME FOR THE ANALYSIS OFHYPERFRAGMENTS AND FOR OTHER EMULSIONSTUDIES,
AD-629 014 FLD. 18/8

•KOLENKO, E. A.
• • •
THERMOELECTRIC COOLING AND ITS PRACTICALAPPLICATION,
AD-629 292 FLD. 13/1

•KOLESNIKOV, K. S.
• • •
FORCED OSCILLATIONS OF A STREAM OF AN IDEALCOMPRESSIBLE LIQUID IN A HOMOGENEOUS STRAIGHTPIPE,
AD-629 060 FLD. 20/4
• • •
LOW FREQUENCY INSTABILITY OF THE NOMINALREGIME OF A LIQUID ROCKET ENGINE,
AD-629 298 FLD. 21/8.1

•KOMOS, V. F.
• • •
ON DETONATION COMBUSTION OF HETEROGENEOUSSYSTEMS,
AD-629 198 FLD. 19/4

•KOSMATOV, S. L.
• • •
CLOSED-CYCLE GAS-TURBINE INSTALLATION,
AD-629 001 FLD. 21/5

•KOTIN, LEON
• • •
ESSENTIALLY POSITIVE SYSTEMS OF LINEARDIFFERENTIAL EQUATIONS,
AD-629 876 FLD. 12/1

•KOURILO, JOHN
• • •
STRUCTURE OF ORGANIC CRYSTALS.
AD-629 079 FLD. 20/2

•KOUVEL, J. S.
• • •
EFFECTS OF PRESSURE ON MAGNETIC INTERACTIONS.
AD-629 986 FLD. 20/3

•KOVALENKO, N. D.
• • •
PERTURBATIONS OF SUPERSONIC FLOW CAUSEDBY DISCRETE OR CONTINUOUSLY DISTRIBUTED HEATAND MASS FLOWS,
AD-629 249 FLD. 20/4

•KOVTUN, I. M.
• • •
CLOSED-CYCLE GAS-TURBINE INSTALLATION,
AD-629 001 FLD. 21/5

•KRAMER, K.
• • •
FERROELECTRICS: THEIR ELECTRICAL BEHAVIORDURING, AND SUBSEQUENT TO, IONIZINGRADIATIONS.
AD-629 091 FLD. 9/1

•KRASILNIKOV, V. M.
• • •
DEVICE FOR SPRAYING FERROMAGNETIC FILMS ONA SUBSTRATE IN A VACUUM,
AD-629 285 FLD. 13/9

•KRAUS, E. B.

• • •
HEAT FLUX AND SURFACE STRESS ON AND NEARAN ISLAND IN THE TRADE WIND REGION.
AD-625 180 FLD. 4/2

*KRISHNAN, T.
• • •
HIGH-RESOLUTION OBSERVATIONS OF THE RADIOSUN AT 9.1 CENTIMETERS ON JULY 20, 1963,
AD-625 366 FLD. 3/2

*KRIVUSHA, V. P.
• • •
ULTRASONIC DEFECTOSCOPY OF TUBES,
AD-625 229 FLD. 13/8

*KROEGER, P.
• • •
FERROELECTRICS: THEIR ELECTRICAL BEHAVIORDURING, AND SUBSEQUENT TO, IONIZINGRADIATIONS.
AD-625 051 FLD. 9/1

*KROSHKIN, M. G.
• • •
FIVE YEARS OF SOVIET SPACE INVESTIGATION,
AD-625 300 FLD. 22/2

*KRUPNIK, A. M.
• • •
PNEUMATIC CONVERTER,
AD-624 906 FLD. 13/7

*KRUSE, RICHARD H.
• • •
RECOVERY OF SPECIFIC MICROORGANISMSFROM URINE AND FECES OF INFECTED ANIMALS,
AD-625 256 FLD. 6/13

*KU, P. M.
• • •
LUBRICATION RESEARCH FOR AERO PROPULSIONSYSTEMS.
AD-625 485 FLD. 11/8

*KUCHERENKO, V. F.
• • •
EXPERIMENTAL INVESTIGATION OF THE INFLUENCEOF LOAD ALTERNATION ON THE FATIGUE STRENGTHAND LONGEVITY OF COMPONENTS WITH AND WITHOUT STRESS CONCENTATION. COMMUNICATION II,
AD-625 147 FLD. 20/11

*KUCHERUK, V. V.
• • •
QUESTIONS IN THE EPIDEMIOLOGY AND PROPHYLAXISOF TULAREMIA,
AD-625 632 FLD. 6/13

*KUCHNIR, FRANCA TAGLIABUE
• • •
NEUTRON SPECTRA FROM MONOENERGETICPHOTONS OF BISMUTH.
AD-625 463 FLD. 20/8

*KUDRIN, A. P.
• • •
NEW METHODS OF PLASMA DIAGNOSTICSACCORDING TO SPECTROSCOPIC DATA,
AD-625 239 FLD. 20/9

*KULTYGIN, A. K.
• • •
METHOD OF PIERCING THE SELECTING MATRIXOF A MEMORY,
AD-625 288 FLD. 9/2

*KULYA, V. I.
• • •
DEVICE FOR THE ANALYSIS OF THE INSTANTANEOUSSPECTRUM OF A VOICE SIGNAL IN HARMONICDECODERS,
AD-625 197 FLD. 20/1

*KUSHWAHA, RAM S.
• • •
HYDROMAGNETIC IONIZING WAVES.
AD-625 171 FLD. 20/9

*KUTZELINIGG, WERNER
• • •
LOWER BOUNDS FOR THE EIGENVALUES OF FIRSTORDER DENSITY MATRICES,
AD-625 212 FLD. 7/4

*KUTZELNIGG, WERNER
• • •
THE INDEPENDENT PARTICLE MODEL FOR MANYELECTRON SYSTEM. II. SYMMETRY PROPERTIES ANDCRITERIA FOR THE VALIDITY OF THE INDEPENDENTPARTICLE MODEL.
AD-625 213 FLD. 7/4

*KUZNETSOV, A. L.
• • •
AERODYNAMICS AND HEAT TRANSFER OF A FLATTURBULENT STREAM FLOWING ALONG A FLATSURFACE,
AD-625 096 FLD. 20/4

*LABAHN, RAYMOND W.
• • •
THE ELASTIC SCATTERING OF LOW ENERGYELECTRONS FROM ATOMIC HELIUM.
AD-625 519 FLD. 20/8

*LAKE, HARRY R.
• • •
CUMBERLAND PLATEAU SEISMOLOGICALOBSERVATORY.
AD-625 593 FLD. 8/11

*LAMEKIN, N. S.
• • •
BASES OF BURNER THEORY FOR LIQUID FUEL WITHGAS GENERATOR,
AD-624 919 FLD. 21/2

*LAND, JAMES E.
• • •
A STUDY OF THE DECOMPOSITION MECHANISMOF AMMONIUM PERCHLORATE.
AD-625 191 FLD. 7/2

*LANDISMAN, M.
• • •
FREE VIBRATIONS OF THE EARTH AND THEPROPERTIES OF ITS DEEP INTERIOR REGIONS.PART I. DENSITY.
AD-625 308 FLD. 8/7

*LANDSHOFF, P. V.
• • •
THE PROBLEM OF CAUSALITY IN S-MATRIXTHEORY,
AD-625 357 FLD. 20/10

*LAPTEVA, N. E.
• • •
REACTIONS OF CHLOROMETHYLSILANES ANDSILOXANE WITH DEHYDRIC PHENOLS,
AD-625 613 FLD. 11/9

*LASHINSKY, HERBERT
• • •
NONLINEAR MECHANICS OF UNIVERSAL PLASMAINSTABILITIES.
AD-625 033 FLD. 20/9

*LASHKO, S. V.
• • •
SPECIFIC FEATURES IN SOLDERING COPPER WITHGALLIUM-BASE SOLDERS,
AD-625 149 FLD. 13/8

*LATYSHEV, V. P.
• • •
POLAROGRAPHIC DETERMINATION OF ACROLEININ THE OXIDATION PRODUCTS OF PROPYLENE ONCOPPER CATALYSTS,
AD-625 057 FLD. 7/3

*LAUER, C.
• • •
ACRONYMS,
AD-625 208 FLD. 5/2

*LAUTZENHEISER, MARVIN
• • •
PROGRAMMING SYSTEM CL-I EXTENDED (CLIX).
AD-625 383 FLD. 9/2

*LAVERY, J. J.
• • •
BAR PRESSING BY THE RAT AS A FUNCTION OFAUDITORY STIMULATION,
AD-625 102 FLD. 5/10

*LAVSKII, V. M.
• • •
AVIATION HANDBOOK (FOR THE PILOT ANDNAVIGATOR),
AD-625 284 FLD. 1/2

*LAWRENCE, WILLARD E.
• • •
MIXTURE DESIGNS FOR FOUR FACTORS,
AD-625 269 FLD. 12/1

*LAYNE, O.
• • •
NERVES OF IRON,
AD-625 241 FLD. 6/5

*LEBEDEV, YA. S.
• • •
TRANSDUCER OF SPECTROMETER OF ELECTRONICPARAMAGNETIC RESONANCE,
AD-625 009 FLD. 20/6

*LEE, D. A.
• • •
THE WAVE NATURE OF MOVING STRIATIONS,
AD-625 189 FLD. 20/9

*LEE, S. -Y.
• • •
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-624 889 FLD. 13/7

*LEFKOWITZ, I.
• • •
FERROELECTRICS: THEIR ELECTRICAL BEHAVIORDURING, AND SUBSEQUENT TO, IONIZINGRADIATIONS.
AD-625 051 FLD. 9/1

*LEIMAN, JOHN M.
• • •
DECISION THEORY AS APPLIED TO PERSONNELCLASSIFICATION AND EVALUATION.
AD-625 004 FLD. 5/9

*LEIPNIK, R. B.
• • •
DIFFUSION AND CONDUCTIVITY OF PLASMAS INSTRONG EXTERNAL FIELDS,
AD-624 998 FLD. 20/9

*LEISTERER, G. A.
• • •
AXIAL COMPRESSOR DESIGN USING ISENTROPICOR NONISENTROPIC SIMPLE RADIAL EQUILIBRIUMEQUATION.
AD-625 079 FLD. 13/7

*LELE, S. G.
• • •
RESEARCH ON CROSSED-FIELD ELECTRONDEVICES.
AD-625 438 FLD. 9/1

*LELYUK, V. O.
• • •
EFFECT OF OIL OXIDATION ON THE PROCESS OFRUNNING-IN A RING-SOCKET PAIR IN AN INTERNALCOMBUSTION ENGINE,
AD-624 910 FLD. 21/7

*LENZYCKI, HENRY P.
• • •

CONCEPTS AND PRACTICES IN THE ASSESSMENTOF HUMAN PERFORMANCE IN AIR FORCE SYSTEMS.
AD-629 041 FLD. 5/10

•LEOVY, C. B.
• • •
PHOTOCHEMICAL DESTABILIZATION OF GRAVITYWAVES NEAR THE MESOPAUSE,
AD-629 011 FLD. 4/1

•LEVI, M. I.
• • •
A NEW VARIETY OF PLAGUE MICROBE,
AD-629 630 FLD. 6/19

•LEVIEN, ROGER
• • •
RELATIONAL DATA FILE: A TOOL FOR MECHANIZEDINFERENCE EXECUTION AND DATA RETRIEVAL,
AD-629 909 FLD. 5/2

•LEVIN, A. N.
• • •
STUDYING THE EFFECT OF ADDITIONS TO POLYCAPROLACTAM 'B' ON ANTIFRICTION PROPERTIESAND ADHESION TO METAL,
AD-629 286 FLD. 11/9

•LEVIN, V. I.
• • •
PNEUMATIC CONVERTER,
AD-629 906 FLD. 13/7

•LEVINA, E. N.
• • •
ANTIGENIC STRUCTURE OF THE BAC. ANTHRACISVACCINAL STRAIN,
AD-629 649 FLD. 6/19

•LEVINSKII, YU. V.
• • •
INVESTIGATION OF THE FORMATION OF AN ALPHASOLID SOLUTION OF NITROGEN IN ZIRCONIUM ATHIGH TEMPERATURES,
AD-629 161 FLD. 13/8

•LEVIS, A. H.
• • •
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-629 885 FLD. 13/7

•LEWIS, E. L.
• • •
INSTRUMENT STANDARDS.
AD-629 929 FLD. 14/2

•LI, TING YI
• • •
EXPERIMENTAL AND ANALYTICAL STUDIES INCONTINUUM HYPERSONIC FLOW.
AD-629 209 FLD. 20/4

•LIBIN, V. A.
• • •
BALANCED MIXER,
AD-629 287 FLD. 9/1

•LIEPMANN, HANS W.
• • •
FINAL SUMMARY REPORT,
AD-629 980 FLD. 20/9

•LIFKA, B. W.
• • •
FRACTURE TOUGHNESS, FATIGUE-CRACKPROPAGATION AND CORROSION CHARACTERISTICS OFALUMINUM ALLOY PLATES FOR WING SKINS.
AD-629 959 FLD. 11/6

•LILLY, ROY S.
• • •
A DEVELOPMENTAL STUDY OF THE SEMANTICDIFFERENTIAL.
AD-629 903 FLD. 5/10

•LIN, CHUIN-SHENG
• • •
A MICROWAVE NOISE SOURCE OF GAS DISCHARGEFOR CIRCULAR WAVEGUIDES,
AD-629 261 FLD. 9/5

•LINDSTEN, DON C.
• • •
BLAST EFFECTS ON U. S. ARMY WATER-STORAGECONTAINERS.
AD-629 396 FLD. 19/4

•LING, GILBERT N.
• • •
THE MEMBRANE THEORY AND OTHER VIEWS FORSOLUTE PERMEABILITY, DISTRIBUTION, ANDTRANSPORT IN LIVING CELLS,
AD-629 871 FLD. 6/3

•LINNEY, D. S.
• • •
A SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.
AD-629 988 FLD. 12/1

•LIPSETT, F. R.
• • •
APPARATUS FOR MEASUREMENT OF THELUMINESCENCE SPECTRA OF CRYSTALS ATN.R.C. OTTAWA,
AD-629 994 FLD. 14/2

•LISKOV, N.
• • •
A SYNTHESIS METHOD FOR LINEAR TIME-VARYINGSYSTEMS.
AD-629 983 FLD. 9/3

•LITTLER, JAMES R.
• • •
EFFECTS OF EXPERIMENTAL PARAMETERS ONTHERMOLUMINESCENCE OF A TYPE II-A DIAMOND.
AD-629 169 FLD. 20/12

•LITVINENKO, E. F.
• • •
NATURAL TULAREMIA FOCI ON THE TERRITORYOF THE UKRAINIAN SSR,
AD-629 647 FLD. 6/19

•LLOYD, K. B.
• • •
METALLURGICAL CHARACTERISTICS OF HIGHSTRENGTH STRUCTURAL MATERIALS.
AD-629 379 FLD. 11/6

•LOBANOV, E. M.
• • •
ABOUT RADIATION INJURIES TO RADIOCOMPONENTS IN A SHARP GAMMA-RADIATIONFIELD,
AD-629 039 FLD. 18/8

•LOCH, JOSEPH
• • •
EXPERIMENTAL AND ANALYTICAL STUDIES INCONTINUUM HYPERSONIC FLOW.
AD-629 209 FLD. 20/4

•LOCKE, J. L.
• • •
2,700 MC./S. SOLAR PATROL AT THE DOMINIONRADIO ASTROPHYSICAL OBSERVATORY, PENTICTON,B.C.
AD-629 998 FLD. 3/2

•LOCKHART, L. B. , JR.
• • •
ATMOSPHERIC RADIOACTIVITY IN ANTARCTICA1956-1963.
AD-629 939 FLD. 4/1

•LOMNEV, S. P.
• • •
METHOD OF RETAINING AND ACCUMULATINGHIGH TEMPERATURE PLASMA IN A TRAP,
AD-629 070 FLD. 20/9

•LONG, JARVIS
• • •
CHAMBER FOR CONTINUOUS MIXING OF HIGHPRESSURE COMBUSTIBLE GASES,
AD-629 969 FLD. 14/2

•LORD, ARTHUR
• • •
PHYSICAL RESEARCH ON PROPERTIES OF II-VICOMPOUND SEMI CONDUCTORS.
AD-629 976 FLD. 20/12

•LOSEV, V. B.
• • •
REACTION OF ORGANOCYCLOSILAZANE WITHDIHYDROXY POLYORGANOSILOXANES,
AD-629 059 FLD. 11/10

•LOVE, TOM J.
• • •
RADIATIVE HEAT TRANSFER BETWEEN PARALLELPLATES SEPARATED BY A NON-ISOTHERMALMEDIUM ANISOTROPIC SCATTERING.
AD-629 209 FLD. 20/13

•LOWDIN, PER-OLAV
• • •
STUDIES IN PERTURBATION THEORY. XI. LOWERBOUNDS TO ENERGY EIGENVALUES, GROUND STATEAND EXCITED STATES,
AD-629 969 FLD. 20/10

•LOWENTHAL, MARVIN J.
• • •
EVALUATION OF METEOROLOGICAL ROCKETWIND SENSORS.
AD-629 388 FLD. 4/2

•LUCAS, CURTIS R.
• • •
METHOD FOR ESTIMATING THE CATAPULTPERFORMANCE OF A CARRIER-BASED AIRPLANE.
AD-629 930 FLD. 1/3

•LUCHANSKII, I. A.
• • •
FROM OARS TO THE WATER-JET,
AD-629 910 FLD. 13/10

•LUDWIG, C. B.
• • •
EMPIRICAL INFRARED ABSORPTION COEFFICIENTSOF H2O FROM 300K TO 3000K.
AD-629 982 FLD. 21/2

•LUND, C.
• • •
NONEQUILIBRIUM SITUATIONS INVOLVINGVACANCIES IN GOLD,
AD-629 877 FLD. 20/2

•LURIA, S. M.
• • •
LIGHTING SURVEY OF U.S.S. DOGFISH (SS350).
AD-629 259 FLD. 13/10

•LWOWSKI, WALTER
• • •
CARBALKOXYNITRENES. THE PHOTOLYTIC DECOMPOSITION OF GASEOUS ALKYL AZIDOFORMATES,
AD-629 937 FLD. 8/1

•LYUSTIBERG, V.
• • •
AURORAS AND IRON DEPOSITS,
AD-629 250 FLD. 4/1

•MA, M. T.
• • •
OPTIMUM NONUNIFORMLY SPACED ANTENNAARRAYS.
AD-629 318 FLD. 9/5

•MACDONALD, J. C.
• • •
BIOSYNTHESIS OF PULCHERRIMINIC ACID,

AD-629 960 FLD. 6/1

•MACGREGOR, D. C.
• • •
EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OFETHANOL FROM ARTERIAL BLOOD,
AD-629 921 FLD. 6/5

•MACH, E. E.
• • •
ION RADICALS. V. PHENOTHIAZINE, PHENOTHIAZINE5-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS,
AD-629 993 FLD. 7/3

•MACINTYRE, FERREN
• • •
ION FRACTIONATION IN DROPS FROM BREAKINGBUBBLES.
AD-629 179 FLD. 7/4

•MACK, R. B.
• • •
THE CONTROL OF ELECTROMAGNETIC SCATTERINGBY IMPEDANCE LOADING.
AD-629 122 FLD. 20/14
• • •
ON MEASURING THE RADAR CROSS SECTIONS OFDUCKS AND CHICKENS.
AD-629 163 FLD. 17/9

•MACMONEGLE, JAMES E.
• • •
TERMINAL WEATHER PREDICTION TECHNIQUES.
AD-629 099 FLD. 4/2

•MADER, CHRISTOPHER
• • •
APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY,
AD-629 948 FLD. 4/2

•MADISON, N. L.
• • •
SYNTHESIS AND EVALUATION OF NEW FIRERESISTANT HYDRAULIC FLUIDS.
AD-629 209 FLD. 11/8

•MADSEN, WAYNE A.
• • •
THE SNAP-THROUGH AND POSTBUCKLINGEQUILIBRIUM BEHAVIOR OF CIRCULAR CYLINDRICALSHELLS UNDER AXIAL LOAD,
AD-629 279 FLD. 20/11

•MAENPAA, JOHN H.
• • •
INVESTIGATION OF FAULT DIAGNOSIS BY TRANSFERFUNCTION TECHNIQUES.
AD-629 987 FLD. 9/3

•MAGDALENO, R. E.
• • •
AN ANALYTICAL STUDY OF V/STOL HANDLINGQUALITIES IN HOVER AND TRANSITION.
AD-629 599 FLD. 1/2

•MAGUIRE, RICHARD G.
• • •
DETERMINATION OF THE STRUCTURE OF O3F2.
AD-629 077 FLD. 7/2

•MAKHMUDOV, D. S.
• • •
STUDYING THE EFFECT OF ADDITIONS TO POLYCAPROLACTAM 'B' ON ANTIFRICTION PROPERTIESAND ADHESION TO METAL,
AD-629 286 FLD. 11/9

•MALANOSKI, S. B.
• • •
EXPERIMENTS ON ULTRA-STABLE GASJOURNAL BEARINGS.
AD-629 923 FLD. 13/9

•MANCINI, ARMANDO
• • •
RESULTS OF SPACE TRIANGULATION ADJUSTMENTSFROM SATELLITE DATA.
AD-629 258 FLD. 8/9
• • •
REDUCTION PROCEDURES FOR ABSOLUTEDIRECTION AND GEODETIC AZIMUTHS FROM OPTICALOBSERVATIONS OF SATELLITES.
AD-629 396 FLD. 8/9

•MANDELKERN, L.
• • •
X-RAY DIFFRACTION STUDIES OF THE MELTINGOF LINEAR POLYETHYLENE,
AD-629 176 FLD. 7/3
• • •
A CALORIMETRIC STUDY OF THE FUSION OFMOLECULAR WEIGHT FRACTIONS OF LINEARPOLYETHYLENE,
AD-629 177 FLD. 7/3

•MAPLETON, R. A.
• • •
ELECTRON CAPTURE FROM ATOMIC NITROGENAND OXYGEN BY PROTONS.
AD-629 138 FLD. 20/8

•MARATHAY, A. S.
• • •
A THEOREM ON THE ZEROS OF CAUSALTRANSFORMS,
AD-629 597 FLD. 12/1

•MARCHESSAULT, R. H.
• • •
A POLYSACCHARIDE GRAFT COPOLYMER PREPAREDBY ANIONIC COUPLING,
AD-629 174 FLD. 11/9

•MARCUVITZ, N.
• • •
MODAL ANALYSIS AND SYNTHESIS OFELECTROMAGNETIC FIELDS.
AD-629 362 FLD. 20/3

•MARINOV, M. P.
• • •
NATURAL TULAREMIA FOCI ON THE TERRITORYOF THE UKRAINIAN SSR,
AD-629 647 FLD. 6/13

•MARKIN, N. I.
• • •
METHOD OF COLLECTING INFORMATION IN ALONG TERM MEMORY DEVICE,
AD-629 240 FLD. 9/2

•MARON, M. E.
• • •
RELATIONAL DATA FILE: A TOOL FOR MECHANIZEDINFERENCE EXECUTION AND DATA RETRIEVAL,
AD-629 909 FLD. 5/2

•MARSHALL, RICHARD E.
• • •
INERTIAL INSTRUMENT DESIGN VERIFICATIONTESTS FOR HIGH-G APPLICATIONS,
AD-629 042 FLD. 17/7

•MARTIN, CHARLES W.
• • •
FRACTURE OF GYPSUM PLASTERS AND CEMENTMORTARS BY DYNAMIC LOADING.
AD-629 458 FLD. 11/2

•MARTIN, D. C.
• • •
DEVELOPMENT OF EQUIPMENT FOR AUTOMATICNARROW-GAP WELDING FOR SHIPYARD USE.
AD-629 419 FLD. 13/9

•MARTIN, J. D.
• • •
A STUDY OF TURBULENT FLOW IN ROUGH PIPES.
AD-629 037 FLD. 20/9

•MARTYNOV, V. M.
• • •
DETERMINING THE ELASTICITY OF SATURATEDVAPORS OF LUBRICATING MATERIALS,
AD-629 199 FLD. 11/8

•MASLOVA, T. N.
• • •
MACROPHAGE CULTURES PREPARED IN VITROAND A MORPHOLOGICAL STUDY OF THEIRCELLULAR ELEMENTS,
AD-629 642 FLD. 6/13

•MASNARI, N. A.
• • •
RESEARCH ON CROSSED-FIELD ELECTRONDEVICES.
AD-629 938 FLD. 9/1

•MASSEY, L. M. , JR.
• • •
A STUDY OF THE RADIATION-INDUCED SOFTENINGOF PLANT TISSUES.
AD-629 983 FLD. 6/8

•MASSON, C. R.
• • •
AN APPROACH TO THE PROBLEM OF IONICDISTRIBUTION IN LIQUID SILICATES,
AD-629 962 FLD. 7/4

•MAST, L. T.
• • •
SOME ASPECTS OF AUTOMATIC TEST AND CHECKOUTIN MISSILE AND SPACE SYSTEMS,
AD-629 392 FLD. 16/1

•MATTIOLI, ENNIO
• • •
ON THE TURBULENCE DEVELOPMENT IN THEBOUNDARY LAYER WITH PRESSURE GRADIENT.
AD-629 361 FLD. 20/4

•MAXWELL, EUGENE L.
• • •
OMEGA NAVIGATIONAL SYSTEM CONDUCTIVITYMAP.
AD-629 490 FLD. 17/7

•MAYBURG, SUMNER
• • •
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIES IN ORGANIC AND INORGANICMATERIALS.
AD-629 889 FLD. 20/12

•MAYEDA, WATARU
• • •
SET OF CUT SETS AND OPTIMUM FLOW,
AD-629 200 FLD. 9/1
• • •
ELEMENTARY COMPLETE TREE TRANSFORMATION,
AD-629 201 FLD. 9/1

•MAYER, MANFRED M.
• • •
ANTIBODY-COMPLEMENT COMPLEXES,
AD-629 873 FLD. 6/13

•MAYOROVA, E. A.
• • •
METHOD OF BONDING POLYAMIDES TO METALS,
AD-629 228 FLD. 13/8

•MAYZLIN, I. E.
• • •
CONCERNING ONE METHOD OF SEEKING DATA AND ITSAPPLICATION IN THE REALIZATION, BY ELECTRONICCOMPUTER, OF THE ALGORITHM OF CRITICAL PATHDETERMINATION,
AD-629 196 FLD. 9/2

•MCAULIFFE, JOHN
• • •

SECONDARY IGNITIONS IN NUCLEAR ATTACK.
AD-629 173 FLD. 13/12

•MCBAIN, J. W.
• • •
TRANSFER OF AIR THROUGH ADSORBED SURFACEFILMS AS A FACTOR IN FOAM STABILITY.
AD-629 349 FLD. 11/11
• • •
PRIMARY ADSORPTION DURING FOAM FORMATION.
AD-629 345 FLD. 11/11
• • •
THE PHYSICAL CHEMISTRY AND STABILITY OFBUBBLES WITH SPECIAL REFERENCE TO AQUEOUSSOLUTIONS. SURFACE VISCOSITY OF DETERGENTSOLUTIONS AS A FACTOR IN FOAM STABILITY.
AD-629 346 FLD. 11/11

•MCBRIDE, THOMAS K.
• • •
INVESTIGATION OF FAULT DIAGNOSIS BY TRANSFERFUNCTION TECHNIQUES.
AD-629 587 FLD. 9/3

•MCCAULEY, DONALD G.
• • •
GAAS INJECTION LASER INVESTIGATION.
AD-629 939 FLD. 20/5

•MCCOMB, ROBERT P.
• • •
PRODUCTION ENGINEERING MEASURECRYSTAL UNIT CR-(XM-96A)/U.
AD-629 202 FLD. 9/1

•MCCULLOCH, E. A.
• • •
RADIOSENSITIVITY OF THE IMMUNE RESPONSE TOSHEEP RED CELLS IN THE MOUSE, AS MEASURED BYTHE HEMOLYTIC PLAQUE METHOD,
AD-629 902 FLD. 6/18
• • •
THE CELLULAR BASIS OF THE GENETICALLYDETERMINED HEMOPOIETIC DEFECT IN ANEMICMICE OF GENOTYPE S1/S1(D),
AD-629 923 FLD. 6/16

•MCCURNIN, T. W.
• • •
FREQUENCY ASSIGNMENT STUDIES.
AD-629 589 FLD. 17/2.1

•MCDERMOT, H. L.
• • •
PENETRATION OF GUINEA PIG AND RABBIT SKINBY DIMETHYL SULFOXIDE SOLUTIONS OF AQUATERNARY OXIME,
AD-629 939 FLD. 6/15

•MCDONEL, JAMES D.
• • •
MEASUREMENT OF THE HEAT TRANSFER TO ATWO-DIMENSIONAL HYPERSONIC INLET WITHVARIABLE GEOMETRY.
AD-629 099 FLD. 20/13

•MCFARLAND, B.
• • •
LASER-PUMPED LASER.
AD-629 338 FLD. 20/5

•MCGEE, ARTHUR A.
• • •
SWISS CIVIL DEFENSE.
AD-629 929 FLD. 15/3

•MCGOWAN, J. W.
• • •
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERICGASES.
AD-629 980 FLD. 4/1

•MCGRATH, JOSEPH E.
• • •
ROLE ASSIGNMENT AND ATTITUDINAL COMMITMENT AS FACTORS IN NEGOTIATION.
AD-629 387 FLD. 5/10
• • •
SOCIAL MOTIVES AND DECISION-MAKINGBEHAVIOR IN INTERPERSONAL SITUATIONS.
AD-629 487 FLD. 5/10
• • •
INTERACTION PROCESS AND TASK OUTCOME INEXPERIMENTALLY-CREATED NEGOTIATION GROUPS.
AD-629 588 FLD. 5/10

•MCHALE, E. T.
• • •
DETERMINATION OF THE DECOMPOSITION KINETICSOF HYDRAZINE USING A SINGLE-PULSE SHOCK TUBE,
AD-629 179 FLD. 7/4

•MCKIE, DOUGLAS
• • •
A MODEL FOR THE GENERALIZABILITY OF TESTSCONSTRUCTED BY STRATIFIED SAMPLING.
AD-629 901 FLD. 5/10

•MEDVEDEV, P. F.
• • •
SEMINAR ON NEW ENSILAGE FORAGE PLANTS,
AD-629 691 FLD. 6/3

•MEECHAM, W. C.
• • •
SIMPLIFIED NORMAL MODE TREATMENT OFLONG-PERIOD ACOUSTIC-GRAVITY WAVES IN THEATMOSPHERE,
AD-629 232 FLD. 17/1

•MEEKER, ROBERT J.
• • •
A PERSONALITY/ATTITUDE SCHEDULE FOR USE INEXPERIMENTAL BARGAINING STUDIES.
AD-629 992 FLD. 5/10

•MEISTER, R. P.
• • •
DEVELOPMENT OF EQUIPMENT FOR AUTOMATICNARROW-GAP WELDING FOR SHIPYARD USE.
AD-629 919 FLD. 13/9

•MELNGAILIS, I.
• • •
MAGNETIC PROPERTIES OF INAS DIODEELECTROLUMINESCENCE,
AD-629 878 FLD. 20/3

•MENZEL, D. H.
• • •
CLASSIFICATION OF SOLAR PROMINENCES FORSUNSPOT CYCLE NO. 19 - 1962,
AD-629 381 FLD. 3/2

•MEREDITH, CONNIE WONG
• • •
BINOCULAR RIVALRY: INDIVIDUAL DIFFERENCESIN ITS FUNCTIONAL RELATIONSHIP TO LUMINANCEAND INSTRUCTIONAL CONDITIONS.
AD-629 900 FLD. 5/10

•MERER, A. J.
• • •
ABSORPTION SPECTRUM OF THE CCN RADICAL,
AD-629 968 FLD. 7/4

•MESSIAH, A. M. L.
• • •
SELECTION RULES FOR PARAFIELDS AND THEABSENCE OF PARA PARTICLES IN NATURE.
AD-629 972 FLD. 20/10

•MESTEROV, V.
• • •
PROTECTION FROM MASS-DESTRUCTION WEAPONS,
AD-629 192 FLD. 5/9

•METELKIN, A. I.
• • •
ZOONOSES OF LABORATORY ANIMALS AND THEIRDANGER TO MAN,
AD-629 610 FLD. 6/3

•MICHA, DAVID A.
• • •
THE INTERACTION POTENTIAL SURFACE FOR H3.
AD-629 219 FLD. 7/4

•MICLOT, RICHARD B.
• • •
DETERMINATION OF THE ALUMINA CONTENT OFALUMINUM ALLOYS.
AD-629 297 FLD. 11/6

•MIDDLEHURST, B. M.
• • •
INVESTIGATION OF O AND B SPECTRA OF STARS.
AD-629 032 FLD. 3/2

•MIKHAILOVA, T. P.
• • •
MECHANICAL STRENGTH OF HIGHLY ALUMINOUSCERAMIC,
AD-629 296 FLD. 11/2

•MILLER, EARL F., II
• • •
VISUAL LOCALIZATION OF THE HORIZONTAL ASA FUNCTION OF BODY TILT UP TO = 90 DEGREESFROM GRAVITATIONAL VERTICAL,
AD-629 266 FLD. 6/19
• • •
OTOLITH ORGAN ACTIVITY WITHIN EARTHSTANDARD, ONE-HALF STANDARD, AND ZERO GRAVITYENVIRONMENTS.
AD-629 323 FLD. 6/19

•MILLER, GEORGE P.
• • •
DESIGN IMPROVEMENT OF HIGH TEMPERATUREINITIATOR DESIGNATED 'INITIATOR, CARTRIDGEACTUATED: XM100.'
AD-629 912 FLD. 19/1

•MILLER, J. T., JR.
• • •
STUDIES OF LOW-TEMPERATURE OXIDATIONREACTIONS.
AD-629 307 FLD. 7/2

•MILOJEVIC, SUSAN
• • •
THE INACTIVATION OF ANTITHROMBIN BY ETHER:EVIDENCE AGAINST THE EXISTENCE OFANTITHROMBIN IV,
AD-629 520 FLD. 6/16

•MILOWITZ, J.
• • •
HARMONIC WAVE PROPAGATION IN ELASTIC RODS OFELLIPTICAL CROSS-SECTION.
AD-629 908 FLD. 20/11

•MINAILOS, A. N.
• • •
ANALYSIS OF FLOW NEAR A BLUNT SOLID OFREVOLUTION AT ANGLE OF ATTACK IN SUPERSONICFLOW OF GAS,
AD-629 296 FLD. 20/4

•MINARDI, JOHN E.
• • •
COMPARISON OF TRANSIENT COMPRESSORS FORTHE PRODUCTION OF HIGH TEMPERATURE ANDHIGH DENSITY GASES.
AD-629 970 FLD. 7/1

•MINKA, KARLIS
• • •

ORBIT DETERMINATION AND ANALYSIS BY THEMINIMUM VARIANCE METHOD.
AD-629 993 FLD. 22/3

•MINSKER, E. I.
• • •
REACTION OF ORGANOCYCLOSILAZANE WITHDIHYDROXY POLYORGANOSILOXANES.
AD-629 059 FLD. 11/10

•MIROSHNICHENKE, I. V.
• • •
IMMUNOLOGICAL ACTIVITY OF LYMPHOID ORGANSDURING AEROSOL AND SUBCUTANIOUS TYPHOIDIMMUNIZATION.
AD-629 631 FLD. 6/13

•MIROSHNICHENKO, M. A.
• • •
THE COMPATIBILITY OF ANTHRAX STI VACCINEIN ASSOCIATION WITH PLAGUE TULAREMIA ANDBRUCELLOSIS VACCINES.
AD-629 611 FLD. 6/13

•MISAKI, SUSUMU
• • •
RESEARCH ON SYNTHESIS OF UNSATURATEDFLUOROCARBON COMPOUNDS.
AD-629 867 FLD. 11/10

•MITCHELL, F. M.
• • •
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-629 885 FLD. 13/7

•MITROVICH, V. P.
• • •
STUDY OF FRICTION OF POLYAMIDES ON STEEL.
AD-629 309 FLD. 11/9

•MOELLER, WILLIAM A.
• • •
TRAINING REQUIREMENTS FOR POSTATTACKADAPTIVE BEHAVIOR.
AD-629 870 FLD. 19/3

•MOHLER, O. C.
• • •
BASIC SOLAR RESEARCH.
AD-629 026 FLD. 3/2

•MOISEIWITSCH, B. L.
• • •
THE TAMM VARIATIONAL PRINCIPLE AND ITSGENERALIZATION TO THE SCATTERING AMPLITUDE.
AD-629 278 FLD. 20/10

•MOLL, KENDALL
• • •
SECONDARY IGNITIONS IN NUCLEAR ATTACK.
AD-629 173 FLD. 13/12

•MOLZEN, ARNOLD E.
• • •
ELECTRICAL PROPERTIES OF PLASTIC MATERIALS:DATA COMPILED FROM TECHNICAL CONFERENCESEARCH.
AD-629 922 FLD. 11/9

•MONEGO, CONSTANTIN J.
• • •
THE BIAXIAL STRESS-STRAIN BEHAVIOR OF FABRICS.
AD-629 259 FLD. 11/5

•MONIN, A. S.
• • •
THE STRUCTURE OF THE FIELDS OF WINDVELOCITY AND TEMPERATURE IN THE SURFACELAYER OF THE ATMOSPHERE.
AD-629 621 FLD. 4/2

•MONKHOUSE, FRANK C.
• • •
THE INACTIVATION OF ANTITHROMBIN BY ETHER:EVIDENCE AGAINST THE EXISTENCE OFANTITHROMBIN IV.
AD-629 520 FLD. 6/16

•MONROE, R. E.
• • •
DEVELOPMENT OF EQUIPMENT FOR AUTOMATICNARROW-GAP WELDING FOR SHIPYARD USE.
AD-629 419 FLD. 13/9

•MOORE, GEORGE P.
• • •
SPIKE PROBABILITIES IN NEURONES: INFLUENCEOF TEMPORAL STRUCTURE IN THE TRAIN OFSYNAPTIC EVENTS.
AD-629 410 FLD. 6/5

•MOORE, R. C.
• • •
NUMERICAL ESTIMATES OF LUMINANCE ANDTOTAL BRIGHTNESS OF THE TERRESTRIAL HALO.
AD-629 233 FLD. 4/1
• • •
ON THE SCATTERING OF SUNLIGHT INTO PLANETARYSHADOW CONES.
AD-629 260 FLD. 4/1

•MORASKI, LEON KAROL
• • •
AN INVESTIGATION OF THE EFFECTS OF GRAVITYON CRATER FORMATION IN A COHESIONLESSMEDIUM.
AD-629 391 FLD. 19/4

•MORGAN, BERNARD S. , JR.
• • •
COMPUTATIONAL PROCEDURES FOR SENSITIVITYCOEFFICIENTS IN TIME-INVARIANT MULTIVARIABLESYSTEMS.
AD-629 010 FLD. 12/1

•MORGAN, C. R.
• • •
EFFECTS OF PRESSURE ON MAGNETIC INTERACTIONS.
AD-629 486 FLD. 20/3

•MORGAN, ROBERT R.
• • •
OMEGA NAVIGATIONAL SYSTEM CONDUCTIVITYMAP.
AD-629 490 FLD. 17/7

•MORGENAU, HENRY
• • •
PROGRESS REPORT, JANUARY 1, 1966.
AD-629 429 FLD. 20/9

•MORMAN, K. F.
• • •
RESEARCH ON CROSSED-FIELD ELECTRONDEVICES.
AD-629 938 FLD. 9/1

•MOROZ, L. M.
• • •
STRUCTURAL IMPERFECTIONS OF METALS DURINGRECRYSTALLIZATION.
AD-629 194 FLD. 11/6

•MOROZOVA, M. V.
• • •
DETERMINING THE ELASTICITY OF SATURATEDVAPORS OF LUBRICATING MATERIALS.
AD-629 159 FLD. 11/8

•MORRIS, E. R.
• • •
OBJECTIVE TESTS FOR USE IN THE TECHNOLOGYOF COMPRESSED FOODS.
AD-629 869 FLD. 6/8

•MORRISSEY, JAMES F.
• • •
A SYSTEM FOR THE DETERMINATION OF THEVERTICAL WIND PROFILE FROM AN AIRCRAFT.
AD-629 188 FLD. 4/2

•MORSKOV, O.
• • •
AURORAS AND IRON DEPOSITS.
AD-629 290 FLD. 4/1

•MORTENSEN, C. A.
• • •
DUAL-CHANNEL SATELLITE RADIOMETER.
AD-629 380 FLD. 17/5

•MORTON, W. A.
• • •
THERMAL AND ELECTRICAL CONDUCTIVITIES OFBIOLOGICAL FLUIDS AND TISSUES.
AD-629 897 FLD. 6/3

•MOSELEY, WM. D., JR.
• • •
CONCERNING THE ROOTS OF A POLYNOMIAL WHICHCONTAIN A PERTURBATION PARAMETER.
AD-629 912 FLD. 12/1

•MOSES, H. E.
• • •
TRANSFORMATION FROM A LINEAR MOMENTUM TOAN ANGULAR MOMENTUM BASIS FOR RELATIVISTICPARTICLES OF NONZERO MASS AND ANY SPIN.
AD-629 869 FLD. 20/10

•MOTTARD, ELMO J.
• • •
INVESTIGATION OF SELF-EXCITED PLANINGVIBRATION AT LARGE WETTED ASPECT RATIO.
AD-629 339 FLD. 13/10

•MUELLER, JOHN J.
• • •
QUANTUM-MECHANICAL BOLTZMANN EQUATION.
AD-629 881 FLD. 20/10

•MUKHERJEE, TAPAN K.
• • •
SUBSTITUTED PERINAPHTHENYL ANION RADICALS.
AD-629 121 FLD. 7/3

•MULLIGAN, JAMES H., JR.
• • •
MICROELECTRONIC AMPLIFIERS HAVING MINIMUMSENSITIVITY TO ARBITRARY PARAMETER CHANGES.
AD-629 379 FLD. 9/1

•MUNEY, BARBARA F.
• • •
THE EFFECT OF ROLE-REVERSAL DURINGTHE DISCUSSION OF OPPOSING VIEWPOINTS.
AD-629 919 FLD. 5/10

•MUNGALL, A. G.
• • •
ATOMIC TRANSITION SETS CANADA'S TIME.
AD-629 976 FLD. 14/2

•MUNKO, N. P.
• • •
GAS IN THE CHEMICAL INDUSTRY.
AD-629 612 FLD. 7/3

•MURCRAY, DAVID G.
• • •
BALLOON BORNE INFRARED STUDIES.
AD-629 349 FLD. 4/1

•MURCRAY, FRANK H.
• • •
BALLOON BORNE INFRARED STUDIES.
AD-629 349 FLD. 4/1

•MUROZUMI, M.
• • •
CONCENTRATIONS OF COMMON LEAD INGREENLAND SNOWS.
AD-629 947 FLD. 8/5

•MURPHY, J. R.
• • •
THERMAL AND ELECTRICAL CONDUCTIVITIES OFBIOLOGICAL FLUIDS AND TISSUES.
AD-629 897 FLD. 6/3

•MURRAY, G. W.
• • •
PENETRATION OF GUINEA PIG AND RABBIT SKINBY DIMETHYL SULFOXIDE SOLUTIONS OF AQUATERNARY OXIME,
AD-629 935 FLD. 6/19

•MURRAY, T.
• • •
ANTIFERROMAGNETIC SPIN RESONANCE OFCOBR2.6H2O,
AD-629 939 FLD. 20/3

•MURRI, W.
• • •
ELECTRICAL EFFECTS OF SHOCK WAVES: CONDUCTIVITY IN CSI, KI, AND NACL.
AD-629 968 FLD. 20/11

•MYERS, D. K.
• • •
UHF SMALL SIGNAL TRANSISTOR.
AD-629 933 FLD. 9/1

•NABIULLIN, F. KH.
• • •
METHOD OF PROTECTING THE WORKING SURFACEOF SOLAR BATTERIES,
AD-629 186 FLD. 10/2

•NAFE, J.
• • •
FREE VIBRATIONS OF THE EARTH AND THEPROPERTIES OF ITS DEEP INTERIOR REGIONS.PART I. DENSITY.
AD-629 308 FLD. 8/7

•NANEVICZ, JOSEPH E.
• • •
CORRELATION BETWEEN CLEAR-AIR TURBULENCEAND AIRCRAFT ELECTRICAL ACTIVITY.
AD-629 309 FLD. 4/1

•NARTSISSOV, BORIS
• • •
LIFE SUPPORT SYSTEMS, PHOTOSYNTHESIS:ANALYTICAL SURVEY.
AD-629 263 FLD. 6/11

•NASH, ALBERT G.
• • •
VALUE RESPONSIBILITY OF THE DESIGNER.
AD-629 659 FLD. 19/1

•NAUMOV, A. N.
• • •
CLOSED-CYCLE GAS-TURBINE INSTALLATION,
AD-629 001 FLD. 21/5

•NEEDHAM, KENNETH E.
• • •
MINIMUM FUEL TRAJECTORIES FOR THRUSTLIMITED ROCKETS IN AN ADVERSE SQUARE GRAVITYFIELD.
AD-629 395 FLD. 22/2

•NEELY, KEITH K.
• • •
SPEAKING AND LISTENING THROUGH THE HEAD:I. THE INTELLIGIBILITY OF SPEECH RECORDED INQUIET AT DIFFERENT POSITIONS ON THE HEAD ANDTHROAT,
AD-629 109 FLD. 17/2

•NEES, PAUL O.
• • •
SURVEY OF EXISTING METHODS OF FEEDING ANDHOUSING THE CHIMPANZEE.
AD-629 101 FLD. 6/3

•NEIDLE, AMOS
• • •
RESEARCH ON THE METABOLISM OF GLUTATHIONE,GLUTAMINE, AND RELATED COMPOUNDS.
AD-629 499 FLD. 6/16

•NELSON, RICHARD R.
• • •
THE EFFICIENT ACHIEVEMENT OF RAPIDTECHNOLOGICAL PROGRESS-A MAJOR NEWPROBLEM IN PUBLIC FINANCE,
AD-629 472 FLD. 5/1

•NEUIMIN, I. V.
• • •
TEMPERATURE CHANGES IN THE BODY OFORNITHODOROS PAPILLIPES DURING BLOODSUCKING,
AD-629 699 FLD. 6/3

•NICOLIC, M. M.
• • •
A FORTRAN PROGRAMME FOR THE ANALYSIS OFHYPERFRAGMENTS AND FOR OTHER EMULSIONSTUDIES,
AD-629 019 FLD. 18/8

•NIKITENKO, N. I.
• • •
HYDRODYNAMIC RESISTANCE AND HEAT TRANSFEROF A HOUSED DISK WITH RADIAL FLOW IN THE GAP,
AD-629 187 FLD. 20/4

•NISKANEN, W. A.
• • •
A MACRO ANALYSIS OF MILITARY AIR TRANSPORTATION,
AD-629 393 FLD. 15/5

•NORDMARK, G. E.
• • •
FRACTURE TOUGHNESS, FATIGUE-CRACKPROPAGATION AND CORROSION CHARACTERISTICS OFALUMINUM ALLOY PLATES FOR WING SKINS.
AD-629 459 FLD. 11/6

•NORWITZ, GEORGE
• • •
ESTABLISHMENT OF QUALITY ASSURANCEREQUIREMENTS FOR AMINOGUANIDINE BICARBONATE.
AD-629 929 FLD. 19/1

•NOSOTSOV, I. M.
• • •
MOUNTING DEVICE FOR CAISSON PUMPS,
AD-629 141 FLD. 13/11

•NOSTRAND, ROBERT VAN
• • •
SEISMIC DATA LABORATORY.
AD-629 949 FLD. 8/11

•NOVIKOV, S. S.
• • •
TOWARD A THEORY OF STABILITY OF POWDERCOMBUSTION,
AD-629 059 FLD. 21/2

•NOVOSELOVA, A. V.
• • •
PROBLEMS OF SEMICONDUCTOR CHEMISTRY,
AD-629 196 FLD. 7/2

•NOWELL, PETER C.
• • •
THE SEQUENCE OF EVENTS IN RADIATIONCARCINOGENESIS: A UNIFYING FORMULATION,
AD-629 917 FLD. 6/18

•NYGAARD, KAARE J.
• • •
ELECTRON THERMAL DIFFUSIVITY IN RARE-GASAFTERGLOW PLASMAS,
AD-629 082 FLD. 20/9

•OATMAN, LYNN C.
• • •
TARGET DETECTION USING BLACK-AND-WHITETELEVISION. STUDY II: DEGRADED RESOLUTIONAND TARGET-DETECTION PROBABILITY.
AD-629 230 FLD. 17/8
• • •
TARGET DETECTION USING BLACK-AND-WHITETELEVISION. STUDY I. THE EFFECTS OF RESOLUTION DEGRADATION ON TARGET DETECTION.
AD-629 231 FLD. 17/8

•OBERAI, MADAN M.
• • •
A STUDY OF SOME ASPECTS OF JET FLOWS ANDEDGE-TONES,
AD-629 086 FLD. 20/4

•OGURO, M.
• • •
EXPERIMENTAL INVESTIGATIONS OF HYPERSONICFLOW AROUND TWO-DIMENSIONAL CIRCULARCYLINDERS.
AD-629 384 FLD. 20/4

•OHTANI, N.
• • •
MECHANISMS OF TRANSGRANULAR STRESSCORROSION CRACKING OF SOLID SOLUTION ALLOYS,
AD-629 954 FLD. 11/6

•OLDSON, N. P.
• • •
COLLECTIVE PROTECTOR DESIGN AND DEVELOPMENT.
AD-629 402 FLD. 13/13

•OLSEN, L. C.
• • •
PARAMAGNETIC RESONANCE OF TRIVALENTFE57 IN DOUBLE NITRATE CRYSTALS,
AD-629 872 FLD. 7/4

•OLSUFYEV, N. G.
• • •
QUESTIONS IN THE EPIDEMIOLOGY AND PROPHYLAXISOF TULAREMIA,
AD-629 632 FLD. 6/13

•O'MALLEY, JAMES J.
• • •
A POLYSACCHARIDE GRAFT COPOLYMER PREPAREDBY ANIONIC COUPLING,
AD-629 174 FLD. 11/9

•OMAN, RICHARD A.
• • •
CHAMBER FOR CONTINUOUS MIXING OF HIGHPRESSURE COMBUSTIBLE GASES,
AD-629 569 FLD. 14/2

•OPDYCKE, JACK
• • •
THERMODYNAMICS OF THE LIQUID-LIQUIDCRITICAL MIXING REGION.
AD-629 455 FLD. 20/13

•OSER, HANSJORG
• • •
SCATTERING PROPERTIES OF CONCENTRIC SOOTWATER SPHERES FOR VISIBLE AND INFRAREDLIGHT,
AD-629 952 FLD. 20/6

•OVCHINNIKOVA, T. V.
• • •
METHOD OF BONDING POLYAMIDES TO METALS,
AD-629 228 FLD. 13/8

•PAASIVIRTA, J.
• • •
EXCHANGE REACTIONS IN THE SYSTEM BORONTRIFLUORIDEMETHANOL,
AD-629 965 FLD. 7/4

•PAKHOMOV, V. I.

• • •
REACTIONS OF CHLOROMETHYLSILANES ANDSILOXANE WITH DEHYDRIC PHENOLS,
AD-629 619 FLD. 11/9

•PALMER, H. B.
• • •
DETERMINATION OF THE DECOMPOSITION KINETICSOF HYDRAZINE USING A SINGLE-PULSE SHOCK TUBE,
AD-629 179 FLD. 7/4

•PALMER, PETER J.
• • •
INERTIAL INSTRUMENT DESIGN VERIFICATIONTESTS FOR HIGH-G APPLICATIONS,
AD-629 092 FLD. 17/7

•PARANDJUK, SERAPHIM
• • •
THE THEORY OF DETONATION, THE COMBUSTIONMECHANISM, AND THE PROPERTIES OF EXPLOSIVES,
AD-629 326 FLD. 19/4

•PARKER, TREADWAY C.
• • •
CONCEPTS AND PRACTICES IN THE ASSESSMENTOF HUMAN PERFORMANCE IN AIR FORCE SYSTEMS.
AD-629 041 FLD. 5/10

•PARKER-RHODES, A. F.
• • •
A SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.
AD-629 488 FLD. 12/1

•PARKHOMENKO, V. B.
• • •
NEW ANTIFRICTION AND CHEMICALLY STABLEMATERIALS,
AD-629 092 FLD. 11/9

•PARKS, V. J.
• • •
AN EXPERIMENTAL STUDY OF STRESSES AT THEINTERFACE OF PROPELLANT GRAINS AND MOTORCASES DUE TO THERMAL LOADING OF THESHRINKAGE TYPE. STRESSES IN SQUARE SLABS,WITH DIFFERENT EDGE GEOMETRIES, WHENBONDED ON ONE FACE TO A RIGID PLATE ANDSHRUNK.
AD-629 220 FLD. 21/9

•PARTS, L.
• • •
STUDIES OF LOW-TEMPERATURE OXIDATIONREACTIONS.
AD-629 307 FLD. 7/2

•PASIKA, W. M.
• • •
SEMIQUANTITATIVE ASPECT OF SHORTBRANCH DETECTION BY USING POLYELECTROLYTEEXPANSIVE EFFECTS,
AD-629 524 FLD. 7/4

•PASTOR, R. C.
• • •
LASER-PUMPED LASER.
AD-629 338 FLD. 20/5

•PASTUKHOV, B. N.
• • •
QUESTIONS IN THE EPIDEMIOLOGY AND PROPHYLAXISOF TULAREMIA,
AD-629 632 FLD. 6/13

•PATEL, YEZDI J.
• • •
BRAIN LESIONS AND HYPERBARIC OXYGENCONVULSIONS,
AD-629 927 FLD. 6/5

•PATTERSON, C.
• • •
CONCENTRATIONS OF COMMON LEAD INGREENLAND SNOWS,
AD-629 997 FLD. 8/8

•PATTERSON, R. L. ; JR.
• • •
ATMOSPHERIC RADIOACTIVITY IN ANTARCTICA1956-1963.
AD-629 439 FLD. 4/1

•PAUL, J. T., JR.
• • •
INFLUENCE OF ENVIRONMENT ON ROVING ANDLAMINATE PROPERTIES,
AD-629 030 FLD. 11/5

•PAVIKOVICH, A. M.
• • •
ANTIWEAR ADDITIVE FOR LUBRICATING OILS,
AD-629 093 FLD. 11/8

•PAVLOSKII, E. N.
• • •
CONTRIBUTION TO THE BIOLOGY OF THE TICKORNITHODOROS PAPILLIPES,
AD-629 629 FLD. 6/3

•PAVLOVSKII, E. N.
• • •
THE FUNCTIONAL MORPHOLOGY OF ORNITHODOROSTICKS,
AD-629 627 FLD. 6/3
• • •
EXPERIMENTAL ANALYSIS OF THE IMPORTANCE OFTHE DIFFERENT PHASES IN THE METAMORPHOSISOF ORNITHODOROS PAPILLIPES IN THE TRANSMISSIONOF THE SPIROCHAETES OF TICK-BORNE RELAPSINGFEVER,
AD-629 639 FLD. 6/3
• • •
THE REACTION OF ORNITHODOROS PAPILLIPESBIR. TO SOME PHYSICAL FACTORS OF THE ENVIRONMENT,
AD-629 640 FLD. 6/3
• • •
THE EFFECT OF REDUCED ATMOSPHERICPRESSURE AND SEVERAL GASES ON THE TICKSORNITHODOROS PAPILLIPES BIR.,
AD-629 653 FLD. 6/3

•PAZIN, G. M.
• • •
PLASTIC MARINE FITTINGS,
AD-629 614 FLD. 13/10

•PEAK, L. S.
• • •
ENERGY ESTIMATION FOR HIGH-ENERGY NUCLEARINTERACTIONS,
AD-629 964 FLD. 20/8

•PENN, SAMUEL
• • •
OZONE AND TEMPERATURE STRUCTURE IN AHURRICANE.
AD-629 123 FLD. 4/2

•PERESLAVTSEV, E. B,
• • •
METHOD OF RETAINING AND ACCUMULATINGHIGH TEMPERATURE PLASMA IN A TRAP,
AD-629 070 FLD. 20/9

•PERKEL, DONALD H.
• • •
SPIKE PROBABILITIES IN NEURONES: INFLUENCEOF TEMPORAL STRUCTURE IN THE TRAIN OFSYNAPTIC EVENTS,
AD-629 410 FLD. 6/5

•PERLMAN, B.
• • •
TUNABLE SOLID STATE GENERATOR.
AD-629 310 FLD. 9/5

•PERPER, L. J.
• • •
FREQUENCY ASSIGNMENT STUDIES.
AD-629 989 FLD. 17/2.1

•PERRY, DOUG
• • •
RESEARCH ON SYNTHESIS OF UNSATURATEDFLUOROCARBON COMPOUNDS.
AD-629 867 FLD. 11/10

•PERTSEV, A. N.
• • •
EFFECT OF GAMMA-RAYS CO60 ON F. E. U.PARAMETERS,
AD-629 197 FLD. 9/1

•PETRILENKOVA, E. B.
• • •
PRODUCTION PROCESS FOR FOAM PLASTICS,
AD-629 168 FLD. 11/9

•PETROV, V. E.
• • •
AMMONIA MASER (AMMONIA MOLECULARGENERATOR),
AD-629 196 FLD. 20/5

•PHARES, N. R.
• • •
OBJECTIVE CROSS-SECTION ANALYSIS.
AD-629 137 FLD. 4/1

•PHELPS, A. V.
• • •
BASIC PLASMA PROCESSES.
AD-629 927 FLD. 20/9

•PHILLIPS, B. D.
• • •
IONIC COPOLYMERIZATION OF STYRENE ANDP-METHYL-STYRENE.
AD-629 541 FLD. 11/9

•PHILLIPS, D.
• • •
THE EFFECT OF PRESSURE AND TEMPERATUREON THE ELECTRICAL RESISTANCE OF RUBIDIUM ANDCAESIUM.
AD-629 970 FLD. 11/6

•PHILLIPS, M. S.
• • •
MEASUREMENT OF WIND SHEAR.
AD-629 335 FLD. 4/2

•PICKEN, J.
• • •
HIGH-RESOLUTION OBSERVATIONS OF THE RADIOSUN AT 9.1 CENTIMETERS ON JULY 20, 1963,
AD-629 366 FLD. 3/2

•PINCHAK, ALFRED
• • •
AERODYNAMIC PERFORMANCE OF REVERSEDFLOW VORTEX CHAMBERS.
AD-629 905 FLD. 14/2

•PIOPENKO, V. G.
• • •
THE COMPATIBILITY OF ANTHRAX STI VACCINEIN ASSOCIATION WITH PLAGUE TULAREMIA ANDBRUCELLOSIS VACCINES,
AD-629 611 FLD. 6/13

•PISAREVSKII, A. N.
• • •
EFFECT OF GAMMA-RAYS CO60 ON F. E. U.PARAMETERS,
AD-629 197 FLD. 9/1

•PLENDL, JOHANNES N.
• • •
CHARACTERISTIC FREQUENCIES FROM INFRAREDAND ELASTIC DATA.
AD-629 166 FLD. 20/12

•PLESHANOV, A. S.
• • •
PASSAGE OF AN UNBALANCED GAS THROUGHTHE CRITICAL SECTION OF A NOZZLE,
AD-629 069 FLD. 20/4

•POHL, HERBERT A.
• • •
THE INTERACTION POTENTIAL SURFACE FOR H3.
AD-625 214 FLD. 7/4

•POHL, HERMANN
• • •
SEASONAL ACCLIMATIZATION IN VARYING HARE(LEPUS AMERICANUS),
AD-624 956 FLD. 6/3

•POIRIER, J. L.
• • •
MICROWAVE MEASUREMENTS OF PARTIALLYCOHERENT FIELDS.
AD-625 128 FLD. 20/14

•POLAK, ARNOLD
• • •
EXPERIMENTAL AND ANALYTICAL STUDIES INCONTINUUM HYPERSONIC FLOW.
AD-625 209 FLD. 20/4
• • •
CALCULATION OF THE FORCE COEFFICIENT FORDELTA WINGS IN HYPERSONIC FLOW.
AD-625 404 FLD. 20/4

•POLINOVSKII, A. YU.
• • •
MOUNTING DEVICE FOR CAISSON PUMPS,
AD-625 141 FLD. 13/11

•POLKINGHORNE, J. C.
• • •
A MODEL REQUIRING LIE GROUP SYMMETRIES,
AD-625 398 FLD. 20/8

•POLYAKOVA, N. L.
• • •
MECHANICAL STRENGTH OF HIGHLY ALUMINOUSCERAMIC,
AD-625 296 FLD. 11/2

•POPLAVKO-MIKHAILOV, M. V.
• • •
METHOD OF WELDING BY THE FUSING OF BETATITANIUM ALLOYS,
AD-625 069 FLD. 13/8

•POPLAWSKI, ROBERT
• • •
AERODYNAMIC PERFORMANCE OF REVERSEDFLOW VORTEX CHAMBERS,
AD-625 909 FLD. 14/2

•POPOVA, N. I.
• • •
POLAROGRAPHIC DETERMINATION OF ACROLEININ THE OXIDATION PRODUCTS OF PROPYLENE ONCOPPER CATALYSTS,
AD-625 057 FLD. 7/3

•POPPENDIEK, H. F.
• • •
THERMAL AND ELECTRICAL CONDUCTIVITIES OFBIOLOGICAL FLUIDS AND TISSUES.
AD-624 897 FLD. 6/3

•POSTMAN, LEO
• • •
UNLEARNING UNDER CONDITIONS OF SUCCESSIVEINTERPOLATION,
AD-625 283 FLD. 5/10

•POSTNIKOV, V. S.
• • •
INFLUENCE OF HEAT TREATMENT ON THEPHYSICOMECHANICAL PROPERTIES OF STEELS OF THEAUSTENITE-MARTENSITE CLASS,
AD-625 293 FLD. 11/6

•POTTER, M. D.
• • •
THERMODYNAMIC PROPERTIES OF PROPELLANTCOMBUSTION PRODUCTS.
AD-625 044 FLD. 21/2

•POVAROVA, K. B.
• • •
PROPERTIES AND USES OF RHENIUM,
AD-624 905 FLD. 11/6

•PRKHODOKO, Z. N.
• • •
STIMULATION OF TYPHOID AGGLUTININS UNDERTHE INFLUENCE OF THE EV PLAGUE VACCINE,
AD-625 608 FLD. 6/13

•PROKHORENKOV, B. P.
• • •
BALANCED MIXER,
AD-625 287 FLD. 9/1

•PURE, R. R.
• • •
EXTERNAL STORAGE FOR COMPUTERS,
AD-625 295 FLD. 9/2

•PURNAIYA, M.
• • •
UHF SMALL SIGNAL TRANSISTOR.
AD-625 933 FLD. 9/1

•PUZAK, P. P.
• • •
METALLURGICAL CHARACTERISTICS OF HIGHSTRENGTH STRUCTURAL MATERIALS.
AD-625 379 FLD. 11/6

•RABINOVICH, B. I.
• • •
EQUATIONS OF TRANSVERSE VIBRATIONS OFFLUID-FILLED SHELLS,
AD-625 052 FLD. 20/11
• • •
EQUATIONS FOR THE PERTURBED MOTION OF ARIGID BODY WITH A CYLINDRICAL CAVITYPARTIALLY FILLED WITH LIQUID,
AD-625 517 FLD. 20/11

•RABINOVICH, YA. S.
• • •
ON ONE MATHEMATICAL PROBLEM OF THE THEORYOF HEAT TRANSFER,
AD-625 066 FLD. 4/1

•RABINOVITCH, M. SAM
• • •
SPATIAL ORGANIZATION OF CHILDREN'SRESPONSES TO A PICTORIAL DISPLAY,
AD-625 107 FLD. 5/10

•RACHINSKII, F. YU.
• • •
METHOD OF IMPROVING THE THERMO-OXIDATIONSTABILITY OF HYDROCARBON FUELS,
AD-625 247 FLD. 21/4

•RAFFALOVICH, AUBREY
• • •
IMPROVED THIN-FILM CAPACITOR CHARACTERISTICSBy REANODIZATION.
AD-625 931 FLD. 9/1

•RAFFEL, JACK I.
• • •
GRAPHICS.
AD-625 567 FLD. 5/8

•RAK, M. V.
• • •
METHOD OF DETERMINING THE FUEL COMPONENTSIN GASEOUS MIXTURES,
AD-625 185 FLD. 21/4

•RAMISHVILI, G. S.
• • •
AUTOMATIC RECOGNITION OF SPEAKING PERSONS,
AD-625 303 FLD. 17/2

•RANDALL, R.
• • •
THERMAL AND ELECTRICAL CONDUCTIVITIES OFBIOLOGICAL FLUIDS AND TISSUES.
AD-624 897 FLD. 6/3

•RANKEN, HOWARD B.
• • •
LUMINANCE, PURITY AND WAVELENGTH MATCHES OFCONTRAST COLORS,
AD-625 282 FLD. 6/16

•RAPPAPORT, DONALD C.
• • •
COMPARISON OF SKIP LOT AND GRAND LOTBALLISTIC TESTING BY USE OF COMPUTERSIMULATION.
AD-625 698 FLD. 19/1

•RAYMOND, J. J.
• • •
AMPLIFICATION OF MAGNETOELASTIC WAVES INYTTRIUM IRON GARNET AT 300K,
AD-624 981 FLD. 20/12

•RAYMOND, JAMES P.
• • •
STUDY FOR GENERALIZED MODEL FOR SEMICONDUCTOR RADIATION RESPONSE PREDICTION.
AD-625 341 FLD. 18/8

•REDIKER, R. H.
• • •
MAGNETIC PROPERTIES OF INAS DIODEELECTROLUMINESCENCE,
AD-624 878 FLD. 20/3

•REEVES, ROGER D.
• • •
VISCOSITY MEASUREMENTS OF IONIC MELTS ATTEMPERATURES TO 1100C.
AD-625 536 FLD. 7/9

•REGEL', A. R.
• • •
THERMOELECTRIC COOLING AND ITS PRACTICALAPPLICATION,
AD-625 292 FLD. 13/1

•REMPEL, G. G.
• • •
CONTRIBUTION TO THE PROBLEM OF ESTIMATINGTHE LENGTH OF THE CHEMICAL REACTION ZONEBEHIND THE FRONT OF A DETONATION WAVE,
AD-625 574 FLD. 19/9

•RENG-YUNG, TU
• • •
DIMENSIONLESS CHARACTERISTICS OF GAS TURBINEUNITS WITH SLITTED SHAFTS,
AD-625 182 FLD. 21/9

•REYNOLDS, J. M.
• • •
EFFECT OF A CYLINDRICAL BOUNDARY ON THEADDED MASS OF TWO CYLINDERS IN LIQUID HELIUM,
AD-625 656 FLD. 20/4

•RICHARDS, DONALD L.
• • •
MONOTONE CONGRUENCE ALGORITHMS,
AD-625 046 FLD. 9/2

•RICHARDSON, ALAN
• • •
THE PLACE OF SUBJECTIVE EXPERIENCE INCONTEMPORARY PSYCHOLOGY.
AD-625 109 FLD. 5/10

•RICHARDSON, DAVID L.
• • •
STUDY AND DEVELOPMENT OF MATERIALS ANDTECHNIQUES FOR PASSIVE THERMAL CONTROL OFFLEXIBLE EXTRAVEHICULAR SPACE GARMENTS.
AD-624 886 FLD. 6/11

•RICHARDSON, H. H.
• • •

BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-629 889 FLD. 13/7

•RICHTER, J.
• • •
NEW METHOD OF MEASURING TRANSITIONPROBABILITIES.
AD-629 599 FLD. 7/4

•RILEY, JOHN A.
• • •
THE ALGEBRA OF BLOCK DIAGRAMS,
AD-629 081 FLD. 12/1

•ROBERTSON, J. M.
• • •
A STUDY OF TURBULENT FLOW IN ROUGH PIPES.
AD-629 037 FLD. 20/4

•ROBINSON, JANE J.
• • •
THE TRANSFORMATION OF SENTENCES FORINFORMATION RETRIEVAL,
AD-629 890 FLD. 9/2

•ROBINSON, M. C.
• • •
THE EFFECT OF PRESSURE ON THE FERROMAGNETICPHASE TRANSITION OF EUO,
AD-629 109 FLD. 20/12

•ROBOVA, V. A.
• • •
DIMENSIONLESS CHARACTERISTICS OF GAS TURBINEUNITS WITH SLITTED SHAFTS,
AD-629 182 FLD. 21/5

•RODEN, ROBERT
• • •
ARRAY RESEARCH.
AD-629 596 FLD. 8/11

•RODGERS, SAM
• • •
ARRAY RESEARCH.
AD-629 556 FLD. 8/11

•RODLEY, G. A.
• • •
INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARYARSINE OXIDES,
AD-629 646 FLD. 7/4

•RODMAN, JAMES P.
• • •
A DUAL-CHANNEL PULSE-COUNTING ASTRONOMICALSPECTROPHOTOMETER,
AD-629 882 FLD. 3/2
• • •
ON JOVIAN H-ALPHA AURORAL ACTIVITY,
AD-629 883 FLD. 3/2

•ROEDER, KENNETH D.
• • •
SUMMARY REPORT.
AD-629 039 FLD. 6/3

•ROHAN, P.
• • •
A THEOREM ON THE ZEROS OF CAUSALTRANSFORMS,
AD-629 957 FLD. 12/1
• • •
A NOTE ON FIELD THEORIES WITHOUT MASSRENORMALIZATION,
AD-629 959 FLD. 20/8
• • •
MASS FORMULA IN THE COVARIANT SPIN-UNITARYSPIN SCHEME,
AD-629 961 FLD. 20/8

•ROMANOV, V. A.
• • •
STIMULATION OF TYPHOID AGGLUTININS UNDERTHE INFLUENCE OF THE EV PLAGUE VACCINE,
AD-629 608 FLD. 6/13

•ROSENTHAL, MILTON L.
• • •
TELEMETRY ANTENNA FOR LINCOLN EXPERIMENTALSATELLITES LES-1 AND LES-2.
AD-629 936 FLD. 9/6

•ROSENWASSER, HYMAN
• • •
FULMINATES: A LITERATURE SURVEY.
AD-629 397 FLD. 7/3

•ROSENZWEIG, R.
• • •
TRANSISTOR, VHF, SILICON, POWER, LINEAR,30-MC, 100 WATTS PEP.
AD-629 329 FLD. 9/1

•ROSNER, DANIEL E.
• • •
TRANSPIRATION COOLING WITH CHEMICALREACTIONS,
AD-629 367 FLD. 20/13

•ROTH, N.
• • •
EFFECT OF EXPOSURE TO OXYGEN ON CHANGESIN MEATS AND VEGETABLES DURING STORAGE.
AD-629 489 FLD. 6/8

•ROTMAN, W.
• • •
MICROWAVE MEASUREMENTS OF PARTIALLYCOHERENT FIELDS.
AD-629 128 FLD. 20/14

•RUBIN, ALLEN G.
• • •
HYDROMAGNETIC IONIZING WAVES.
AD-629 171 FLD. 20/9

•RUBIN, H.
• • •
THE SIGN TEST ON AUTOREGRESSIVE DATA.
AD-629 272 FLD. 12/1

•RUGER, CHARLES J.
• • •
AN APPROXIMATE SOLUTION OF THE CROCCOEQUATION,
AD-629 206 FLD. 12/1

•RULA, A. A.
• • •
AERIAL PENETROMETER DEMONSTRATION ATFORT RUCKER, ALABAMA,
AD-629 601 FLD. 14/2

•RUSSELL, D. S.
• • •
DEVELOPMENTS IN ANALYTICAL CHEMISTRY ATNRC,
AD-629 975 FLD. 7/2

•RUSSELL, E. S.
• • •
THE CELLULAR BASIS OF THE GENETICALLYDETERMINED HEMOPOIETIC DEFECT IN ANEMICMICE OF GENOTYPE S1/S1(D),
AD-629 923 FLD. 6/16

•RUSSELL, H. W.
• • •
TONTO FOREST SEISMOLOGICAL OBSERVATORY.
AD-629 969 FLD. 8/11

•RUSSELL, O. R.
• • •
TONTO FOREST SEISMOLOGICAL OBSERVATORY.
AD-629 969 FLD. 8/11

•RUZE, JOHN
• • •
LATERAL-FEED DISPLACEMENT IN APARABOLOID.
AD-629 018 FLD. 9/1

•RYABOKON, M. P.
• • •
TOTAL PRESSURE PROBE FOR A SUPERSONICGAS FLOW WITH A SLIGHTLY NONUNIFORM VELOCITYFIELD,
AD-629 069 FLD. 14/2

•RYAZANTSEV, YU. S.
• • •
TOWARD A THEORY OF STABILITY OF POWDERCOMBUSTION,
AD-629 059 FLD. 21/2

•SABA, WILLIAM G.
• • •
HEAT CAPACITY AND THERMODYNAMICPROPERTIES OF BERYLLIUM ALUMINATE(CHRYSOBERYL), BEO-A1203, FROM 16 TO 300K,
AD-629 096 FLD. 20/13

•SAFRA, R. A.
• • •
STRIGA LUTEA,
AD-629 629 FLD. 6/3

•SAGATOVSKAYA, L. A.
• • •
A NEW VARIETY OF PLAGUE MICROBE,
AD-629 630 FLD. 6/13

•SAITO, S.
• • •
THE VISCOELASTIC RELAXATION MECHANISM OFINORGANIC POLYMERS. IV. SIMULTANEOUSMULTIPLE MECHANISMS.
AD-629 329 FLD. 11/9
• • •
VISCOELASTIC RELAXATION MECHANISMS OFINORGANIC POLYMERS. V. COUNTERION EFFECTSIN BULK POLYELECTROLYTES.
AD-629 331 FLD. 11/9

•SAKHAROV, I. E.
• • •
APPLICATION OF THE METHOD OF DYNAMICSTIFFNESS FOR CALCULATION OF THE FREQUENCYOF NATURAL OSCILLATIONS OF COMPOSITE SHELLS,
AD-629 159 FLD. 20/11

•SALIBEKOV, S. E.
• • •
INVESTIGATION OF THE FORMATION OF AN ALPHASOLID SOLUTION OF NITROGEN IN ZIRCONIUM ATHIGH TEMPERATURES,
AD-629 161 FLD. 13/8

•SALISBURY, S. R.
• • •
FE54(N,P), (N, ALPHA), AND (N,2N) CROSS SECTIONS,
AD-629 980 FLD. 20/8

•SAMARIN, V. G.
• • •
FIVE YEARS OF SOVIET SPACE INVESTIGATION,
AD-629 300 FLD. 22/2

•SANDLER, HAROLD
• • •
CINERADIOGRAPHIC OBSERVATIONS OF HUMANSUBJECTS DURING TRANSVERSE ACCELERATIONSOF +9GX AND +10GX.
AD-629 294 FLD. 6/19

•SARANTSEV, K. B.
• • •
REMOTE STARTING DEVICES FOR GAS TURBINES,
AD-629 149 FLD. 21/5

•SASADA, T.
• • •
VISCOELASTIC RELAXATION MECHANISMS



799-657 O - 66 - 12

OFINORGANIC POLYMERS. V. COUNTERION EFFECTSIN BULK POLYELECTROLYTES.
AD-629 331 FLD. 11/9

•SATO, Y.
• • •
FREE VIBRATIONS OF THE EARTH AND THEPROPERTIES OF ITS DEEP INTERIOR REGIONS.PART I. DENSITY.
AD-629 308 FLD. 8/7

•SAUNDERS, A. W. , JR.
• • •
ATMOSPHERIC RADIOACTIVITY IN ANTARCTICA1956-1963.
AD-629 439 FLD. 4/1

•SAVILLE, G. S.
• • •
POINT DEFECTS IN MAGNESIUM OXIDE,
AD-629 550 FLD. 20/12

•SAVIN, A. V.
• • •
MUTUAL SOLUBILITY OF COPPER AND MOLYBDENUMAND CERTAIN PROPERTIES OF ALLOYS OF MOLYBDENUMWITH COPPER,
AD-629 908 FLD. 11/6

•SCHALLERT, W. L.
• • •
THE DIURNAL VARIATION OF THE VECTORSURFACE WIND AT SEVERAL ICE CAP STATIONS.
AD-629 360 FLD. 4/2

•SCHIFFMAN, R. L.
• • •
CONSOLIDATION DUE TO TANGENTIAL LOADS(CONSOLIDATION PRODUITE PAR DES CHARGES TANGENTIELLES),
AD-629 113 FLD. 13/13

•SCHIFFMAN, ROBERT L.
• • •
DISCUSSION,
AD-629 892 FLD. 8/13

•SCHILLING, G. F.
• • •
NUMERICAL ESTIMATES OF LUMINANCE ANDTOTAL BRIGHTNESS OF THE TERRESTRIAL HALO,
AD-629 239 FLD. 4/1
• • •
ON THE SCATTERING OF SUNLIGHT INTO PLANETARYSHADOW CONES,
AD-629 260 FLD. 4/1

•SCHLAG, E. W.
• • •
ANALYSIS OF RELAXATION PROCESSES IN AMULTILEVEL SYSTEM. A MANY-SHOT EXPANSIONTECHNIQUE,
AD-629 602 FLD. 7/4

•SCHLESSINGER, R. H.
• • •
2,3-NAPHTHOQUINONOID HETEROCYCLES. II. AHIGHLY STABILIZED THIADIAZOLE ANALOG OFANTHRACENE.
AD-629 636 FLD. 7/3
• • •
THE SYNTHESIS OF A PHENANTHRIDENE FROMAN AROMATIC SCHIFF BASE BY A PHOTOOXIDATIVERING CLOSURE.
AD-629 637 FLD. 7/3
• • •
THE PHOTOLYTIC DECOMPOSITION OF SOMESULFONES BY AN INTERNALLY SENSITIZED PATH,
AD-629 638 FLD. 7/3

•SCHLINDER, J. K.
• • •
THE CONTROL OF ELECTROMAGNETIC SCATTERINGBY IMPEDANCE LOADING.
AD-629 122 FLD. 20/14

•SCHMIDT, HARTLAND H.
• • •
THERMODYNAMICS OF THE LIQUID-LIQUIDCRITICAL MIXING REGION.
AD-629 455 FLD. 20/13

•SCHNEIDER, SOL
• • •
FURTHER STUDIES ON HYDROGEN AND DEUTERIUMCLEANUP.
AD-629 389 FLD. 9/1

•SCHNEPP, O.
• • •
INFRARED SPECTRA OF POLYATOMIC HIGHTEMPERATURE MOLECULES.
AD-629 048 FLD. 7/2

•SCHONBAUM, E.
• • •
EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OFETHANOL FROM ARTERIAL BLOOD,
AD-629 921 FLD. 6/5

•SCHWARTZ, CHARLES
• • •
A STUDY OF SOME APPROXIMATION SCHEMES INQUANTUM MECHANICS,
AD-629 594 FLD. 20/10
• • •
SOLUTION OF A BETHE-SALPETER EQUAON,
AD-629 596 FLD. 20/8
• • •
NUMERICAL SOLUTION OF FIXED-SOURCE FIELDTHEORIES,
AD-629 597 FLD. 20/10

•SCHWARTZ, MARTIN
• • •
LIGHT EFFECTS ON OXYGEN EVOLUTION ANDPHOSPHORYLATION IN SPINACH CHLOROPLASTS,
AD-629 097 FLD. 6/3

•SCHWEIZER, W.
• • •
SOLAR XUV SPECTRUM OF MARCH, 1964.
AD-629 131 FLD. 3/2

•SCOTT, B.
• • •
THE CESIUM IONIZATION CROSS SECTION FROMTHRESHOLD TO 90 EV.,
AD-629 451 FLD. 7/4

•SCOTT, R. A.
• • •
HARMONIC WAVE PROPAGATION IN ELASTIC RODS OFELLIPTICAL CROSS-SECTION.
AD-629 408 FLD. 20/11

•SCRIVEN, L. E.
• • •
THE METHOD OF WEIGHTED RESIDUALS AND ITSRELATION TO CERTAIN VARIATIONAL PRINCIPLESFOR THE ANALYSIS OF TRANSPORT PROCESSES,
AD-629 551 FLD. 4/1

•SEGEL, LEONARD
• • •
AIR LOADINGS ON A ROTOR BLADE AS CAUSEDBY TRANSIENT INPUTS OF COLLECTIVE PITCH.
AD-629 860 FLD. 1/1

•SEGUNDO, JOSE P.
• • •
SPIKE PROBABILITIES IN NEURONES: INFLUENCEOF TEMPORAL STRUCTURE IN THE TRAIN OFSYNAPTIC EVENTS,
AD-629 910 FLD. 6/5

•SENITZKY, I. R.
• • •
FUNDAMENTAL THEOREM IN QUANTUM OPTICS,
AD-629 947 FLD. 20/6

•SERAUSKAS, R. V.
• • •
ANALYSIS OF RELAXATION PROCESSES IN AMULTILEVEL SYSTEM. A MANY-SHOT EXPANSIONTECHNIQUE,
AD-629 602 FLD. 7/4

•SEREBRENY, SIDNEY M.
• • •
CORRELATION BETWEEN CLEAR-AIR TURBULENCEAND AIRCRAFT ELECTRICAL ACTIVITY.
AD-629 309 FLD. 4/1

•SERGEYEVA, T. I.
• • •
NITROGENOUS SUBSTANCE CHANGES IN THENUTRITIVE BROTHS PREPARED FROM THE DRYKPD PREPARATION FOLLOWING CULTURING OF CL.BOTULINUM OF THE A, B, C AND E TYPES,
AD-629 617 FLD. 6/13

•SHABASHOV, S. Z.
• • •
REMOTE STARTING DEVICES FOR GAS TURBINES,
AD-629 144 FLD. 21/5

•SHADIEV, N.
• • •
ABOUT RADIATION INJURIES TO RADIOCOMPONENTS IN A SHARP GAMMA-RADIATIONFIELD,
AD-629 039 FLD. 18/8

•SHAKNOV, I. F.
• • •
FLOW OF A NON-ADIABATIC SUPERSONIC FLOW OFAN IDEAL GAS AROUND A FLAT PLATE,
AD-629 061 FLD. 21/2

•SHAM, L. J.
• • •
ONE-PARTICLE PROPERTIES OF AN INHOMOGENEOUS INTERACTING ELECTRON GAS,
AD-629 343 FLD. 7/4

•SHAMIS, SIDNEY S.
• • •
MICROELECTRONIC AMPLIFIERS HAVING MINIMUMSENSITIVITY TO ARBITRARY PARAMETER CHANGES,
AD-629 379 FLD. 9/1

•SHAPOVALOV, M. I.
• • •
ADDITIVE TO SULFUROUS FUEL,
AD-629 248 FLD. 21/4

•SHARSHAKOV, I. M.
• • •
INFLUENCE OF HEAT TREATMENT ON THEPHYSICOMECHANICAL PROPERTIES OF STEELS OF THEAUSTENITE-MARTENSITE CLASS,
AD-629 293 FLD. 11/6

•SHATUNOV, V. M.
• • •
METHOD OF RETAINING AND ACCUMULATINGHIGH TEMPERATURE PLASMA IN A TRAP,
AD-629 070 FLD. 20/9

•SHAW, CHRISTOPHER J.
• • •
THEORY, PRACTICE, AND TREND IN BUSINESSPROGRAMMING.
AD-629 003 FLD. 9/2

•SHAW, H. J.
• • •
RESEARCH ON SELECTED MICROWAVE PROPERTIESOF FERRITES.
AD-629 319 FLD. 20/1

•SHAW, T. M.
• • •

ELECTRON-ION RECONBINATION IN NITRICOXIDE IN THE TEMPERATURE RANGE 196 TO 398K,
AD-625 110 FLD. 7/4

•SHCHEGOLEV, E. YA.
• • •
SECTOR RADIO-RANGE BEACONS WITH RADIATINGEQUISIGNAL ZONES,
AD-624 916 FLD. 17/7

•SHEARS, LOYDA M.
• • •
THE EFFECT OF VARIATIONS IN INTERNAL POWERPATTERN ON COALITION FORMATION IN TETRADS.
AD-625 492 FLD. 5/10

•SHEINKMAN, A. G.
• • •
EXPERIMENTAL STUDY OF A MODEL CONTROLBLEEDER STAGE WITH A ROTATING DIAPHRAGM,
AD-625 194 FLD. 21/5

•SHERIDAN, J.
• • •
MICROWAVE SPECTROSCOPIC STUDIES OFMOLECULES.
AD-625 497 FLD. 7/4

•SHINE, H. J.
• • •
ION RADICALS. VII. THE REACTIONS OFTHIANTHRENE OXIDE IN HYDROCHLORIC ACID,
AD-625 590 FLD. 7/3
• • •
ION RADICALS. VI. PHENOXATHIIN ANDPHENOXATHIIN 9-OXIDE IN SULFURIC ACID,
AD-625 592 FLD. 7/3
• • •
ION RADICALS. V. PHENOTHIAZINE, PHENOTHIAZINES-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS,
AD-625 593 FLD. 7/3

•SHISHKEVISH, CHARLES
• • •
PHOTOIONIZATION IN GASES.
AD-625 312 FLD. 20/3

•SHIVRIN, O. N.
• • •
MOSAIC STRUCTURE OF METALLIC POLYCRYSTALSAND EXTINCTION EFFECTS,
AD-625 249 FLD. 20/2

•SHLINDMAN, V. M.
• • •
RESULTS OF TESTING THE STAGES OF CENTRIFUGALPUMPS WITH VARIOUS FLOW TWISTS AT THE INPUTINTO THE WHEEL,
AD-625 291 FLD. 13/11

•SHOLIN, G. V.
• • •
NEW METHODS OF PLASMA DIAGNOSTICSACCORDING TO SPECTROSCOPIC DATA,
AD-625 239 FLD. 20/9

•SHORE, R. A.
• • •
MICROWAVE MEASUREMENTS OF PARTIALLYCOHERENT FIELDS.
AD-625 128 FLD. 20/14

•SHORTWELL, C. P.
• • •
AN ANALYTICAL STUDY OF V/STOL HANDLINGQUALITIES IN HOVER AND TRANSITION.
AD-625 599 FLD. 1/2

•SHOVKUN, V.
• • •
EXPERIMENT IN THE USE OF EI 893 ALLOY FORGAS-TURBINE BLADES,
AD-625 290 FLD. 21/5

•SHU, SHIH-WEI
• • •
A MICROWAVE NOISE SOURCE OF GAS DISCHARGEFOR CIRCULAR WAVEGUIDES,
AD-625 261 FLD. 9/5

•SHURE, GERALD H.
• • •
A PERSONALITY/ATTITUDE SCHEDULE FOR USE INEXPERIMENTAL BARGAINING STUDIES.
AD-624 992 FLD. 5/10

•SHVARTS, A. G.
• • •
APPLICATION OF ANTIBOTULINUM ALIZARINSUSPENSION AGGLUTININS FOR THE RAPID DETECTIONOF THE BOTULISM CAUSATIVE AGENT,
AD-625 620 FLD. 6/13

•SIFERD, RAYMOND EARL
• • •
SOME PERIODIC TRAJECTORIES IN CISLUNAR SPACEVERY RESTRICTED FOUR BODY APPROXIMATION.
AD-625 373 FLD. 3/3

•SIMINOVITCH, L.
• • •
RADIOSENSITIVITY OF THE IMMUNE RESPONSE TOSHEEP RED CELLS IN THE MOUSE, AS MEASURED BYTHE HEMOLYTIC PLAQUE METHOD,
AD-625 502 FLD. 6/18
• • •
THE CELLULAR BASIS OF THE GENETICALLYDETERMINED HEMOPOIETIC DEFECT IN ANEMICMICE OF GENOTYPE SI/SI(D),
AD-625 523 FLD. 6/16

•SIMMONS, R. F.
• • •
NATURAL-LANGUAGE PROCESSING BY COMPUTERS-1966.
AD-625 005 FLD. 5/7

•SIMMONS, WILLIAM ROBERT
• • •
THE DESIGN AND DEVELOPMENT OF A HIGHRESOLUTION ECHELLE VACUUM SPECTROGRAPHAND ITS APPLICATION TO THE MEASUREMENT OFTHE MOLECULAR CONSTANTS OF THE 1Σ(+) STATEOF NO(+).
AD-625 337 FLD. 20/6

•SIMON, J. W.
• • •
RECIPROCAL TEM FERRITE PHASE SHIFTERS.
AD-625 209 FLD. 9/5

•SIMPSON, J. H.
• • •
A TRANSISTORIZED CATHODE-RAY PHASE-SENSITIVENULL DETECTOR,
AD-624 957 FLD. 9/3

•SIROTYUK, L. V.
• • •
BIOLOGICAL PROPERTIES OF THE NIIEGTULAREMIA VACCINE STRAINS,
AD-625 623 FLD. 6/13

•SIZEMOVA, G. A.
• • •
OMSK HEMORRHAGIC FEVER INCIDENCE IN MANAND MUSKRATS IN WINTER,
AD-625 697 FLD. 6/13

•SKARTVEDT, PAUL STUART
• • •
AN INVESTIGATION OF THE EFFECT OF LAUNCHSITE LOCATION AND VARIATION OF LAUNCHPARAMETERS ON LUNAR-EARTH TRAJECTORIES.
AD-625 394 FLD. 22/3

•SKIFSTAD, JAMES G.
• • •
REVIEW OF THEORETICAL ANALYSES OF ARCHEATING IN A TUBE,
AD-625 598 FLD. 20/9

•SKRYNNIK, A. N.
• • •
CONTRIBUTION TO THE BIOLOGY OF THE TICKORNITHODOROS PAPILLIPES,
AD-625 625 FLD. 6/3
• • •
EXPERIMENTAL ANALYSIS OF THE IMPORTANCE OFTHE DIFFERENT PHASES IN THE METAMORPHOSISOF ORNITHODOROS PAPILLIPES IN THE TRANSMISSIONOF THE SPIROCHAETES OF TICK-BORNE RELAPSINGFEVER,
AD-625 633 FLD. 6/3

•SLESARENKO, A. S.
• • •
NATURAL TULAREMIA FOCI ON THE TERRITORYOF THE UKRAINIAN SSR,
AD-625 647 FLD. 6/13

•SLESARENKO, MICHAEL
• • •
MATERIALS FOR HIGH-TEMPERATURE ENERGYCONVERTERS: ANNOTATED BIBLIOGRAPHY.
AD-625 198 FLD. 10/1

•SLESARENKO, V. V.
• • •
NATURAL TULAREMIA FOCI ON THE TERRITORYOF THE UKRAINIAN SSR,
AD-625 647 FLD. 6/13

•SLETTEN, C. J.
• • •
A LOOK INTO THE FUTURE OF RADAR SCATTERINGRESEARCH AND DEVELOPMENT.
AD-625 169 FLD. 17/9

•SLOAN, WILLIAM A.
• • •
ON JOVIAN H-ALPHA AURORAL ACTIVITY,
AD-624 883 FLD. 3/2

•SLOVIC, PAUL
• • •
SEEKING INFORMATION TO REDUCE THE RISK OFDECISIONS,
AD-625 592 FLD. 5/10

•SMALL, R. J.
• • •
ION RADICALS. VI. PHENOXATHIIN ANDPHENOXATHIIN 9-OXIDE IN SULFURIC ACID,
AD-625 592 FLD. 7/3

•SMALLWOOD, RICHARD D.
• • •
MINIMAX DETECTION STATION PLACEMENT.
AD-625 139 FLD. 19/7

•SMIRNOV, B. I.
• • •
PLASTIC MARINE FITTINGS,
AD-625 614 FLD. 13/10

•SMIRNOVA, G. A.
• • •
GAS-LIQUID CHROMATOGRAPHY OF METHYLETHERS OF HIGHER FATTY ACIDS OF SENDAIVIRUS LIPID COMPONENT,
AD-625 626 FLD. 6/1

•SMITH, A. W. H.
• • •
PRODUCTION ENGINEERING MEASURE FOR IMPROVEDRELIABILITY OF SOLID ELECTROLYTE TANTALUMCAPACITORS.
AD-625 584 FLD. 9/1

•SMITH, HARLAN J.
• • •
ON JOVIAN H-ALPHA AURORAL ACTIVITY,
AD-624 883 FLD. 3/2

• • •
SEARCH FOR PLANETARY OPTICAL EMISSION,AND STUDY OF FLARE ACTIVITY OF NEARBY STARS.
AD-629 895 FLD. 3/2

•SMITH, JANICE L.
• • •
EFFECT OF IONIZING RADIATION ON ANIMALS ANDPLANTS,
AD-629 929 FLD. 6/18

•SMITH, JERRY L.
• • •
A STUDY OF THE EFFECTS OF WET SURFACE SOILCONDITIONS ON THE PERFORMANCE OF A SINGLEPNEUMATIC-TIRED WHEEL.
AD-629 390 FLD. 13/6

•SMITH, VEDENE H.
• • •
LOWER BOUNDS FOR THE EIGENVALUES OF FIRSTORDER DENSITY MATRICES,
AD-629 212 FLD. 7/4

•SMITH, VEDENE H. , JR.
• • •
THE INDEPENDENT PARTICLE MODEL FOR MANYELECTRON SYSTEM. II. SYMMETRY PROPERTIES ANDCRITERIA FOR THE VALIDITY OF THE INDEPENDENTPARTICLE MODEL.
AD-629 213 FLD. 7/4

•SMITH, WILLIAM P.
• • •
REWARD STRUCTURE AND INFORMATION IN THEDEVELOPMENT OF COOPERATION IN TWO-PERSON,TWO-CHOICE GAMES.
AD-629 920 FLD. 5/10

•SOBEL, S.
• • •
A COMPUTERIZED TECHNIQUE TO EXPRESSUNCERTAINTY IN ADVANCED SYSTEM COST ESTIMATES,
AD-629 899 FLD. 5/3

•SOFFER, B. H.
• • •
LASER-PUMPED LASER.
AD-629 338 FLD. 20/5

•SOKOLOV, V. S.
• • •
SEMINAR ON NEW ENSILAGE FORAGE PLANTS,
AD-629 691 FLD. 6/5

•SOLLFREY, W.
• • •
EFFECTS OF PROPAGATION ON THE HIGH-FREQUENCYELECTROMAGNETIC RADIATION FROM LOW-ALTITUDENUCLEAR EXPLOSIONS,
AD-629 079 FLD. 18/3

•SOLOMON, L.
• • •
A BRIEF COMMENT ON THE HYDRAULIC ANALOGYOF AN ACOUSTIC WAVE IN A PIPE,
AD-629 088 FLD. 20/14

•SOLOMON, LOUIS
• • •
THE PROPAGATION PATH OF A WAVE IN AVARIABLE SPEED OF SOUND MEDIUM OBTAINEDBY EMPLOYING FERMAT'S PRINCIPLE,
AD-629 089 FLD. 20/14
• • •
A HYDRAULIC ANALOG STUDY OF THE HARTMANNOSCILLATOR PHENOMENON,
AD-629 085 FLD. 20/4
• • •
FLUID MOTION AND SOUND.
AD-629 087 FLD. 20/4

•SOONG, TSAI-CHEN
• • •
ELASTIC-PLASTIC ANALYSIS OF THE COLLAPSEOF UNIFORMLY COMPRESSED CIRCULAR CYLINDRICALSHELLS,
AD-629 276 FLD. 20/11

•SORENSON, RICHARD C.
• • •
OPTIMAL ALLOCATION OF ENLISTED MENI FULLREGRESSION EQUATIONS VS. APTITUDE AREA SCORES.
AD-629 224 FLD. 5/9

•SOSHIN, L. D.
• • •
EFFECT OF GAMMA-RAYS CO60 ON F. E. U.PARAMETERS,
AD-629 187 FLD. 9/1

•SOTIROPOULOS, A.
• • •
A SHAPED REFLECTOR AS A PRIMARY FEED FORHAYSTACK.
AD-629 378 FLD. 9/5

•SOURIRAJAN, S.
• • •
CHARACTERISTICS OF POROUS CELLULOSE ACETATEMEMBRANES FOR THE SEPARATION OF SOMEORGANIC SUBSTANCES IN AQUEOUS SOLUTION,
AD-629 966 FLD. 7/4

•SPINKOV, N. I.
• • •
DEVICE FOR SPRAYING FERROMAGNETIC FILMS ONA SUBSTRATE IN A VACUUM,
AD-629 288 FLD. 13/9

•SPIRN, REGINA VOLFOVSKY
• • •
RARE EARTH DISTRIBUTIONS IN THE MARINEENVIRONMENT.
AD-629 297 FLD. 8/3

•SPIVAK, M. S.
• • •
DEVELOPMENT OF A FIXTURE AND A PROCEDUREFOR HARD-ANODIZING THE SURFACES OF A LONGALUMINUM TUBE WITH A DEEP BLIND-HOLE.
AD-629 993 FLD. 11/3

•STACEY, G. M.
• • •
THE TAMM VARIATIONAL PRINCIPLE AND ITSGENERALIZATION TO THE SCATTERING AMPLITUDE.
AD-629 278 FLD. 20/10

•STADELMAIER, H. H.
• • •
TERNARY INTERSTITIAL COMPOUNDS OF BORONAND NITROGEN WITH TRANSITION AND POSTTRANSITION METALS.
AD-629 028 FLD. 11/6

•STAHL, WALTER J.
• • •
INVESTIGATION OF FAULT DIAGNOSIS BY TRANSFERFUNCTION TECHNIQUES.
AD-629 587 FLD. 9/3

•STAPLEFORD, R. L.
• • •
AN ANALYTICAL STUDY OF V/STOL HANDLINGQUALITIES IN HOVER AND TRANSITION.
AD-629 999 FLD. 1/2

•STARODUBTSEV, S. V.
• • •
EFFECT OF GAMMA RADIATION ON THE FLUORESCENT YIELD OF RUBY,
AD-629 294 FLD. 20/2

•STAROVA, L. L.
• • •
METHOD OF WELDING BY THE FUSING OF BETATITANIUM ALLOYS,
AD-629 069 FLD. 13/8

•STATLER, R. L.
• • •
RADIATION DAMAGE IN SILICON SOLAR CELLS FROM4.6-MEV PROTON BOMBARDMENT.
AD-629 990 FLD. 10/2

•STAVRAKY, GEORGE W.
• • •
BRAIN LESIONS AND HYPERBARIC OXYGENCONVULSIONS,
AD-629 927 FLD. 6/5

•STEBBINGS, R. F.
• • •
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERICGASES.
AD-629 980 FLD. 4/1

•STEPANYUK, V. V.
• • •
OSCILLATIONS AND STABILITY OF A TRIPLELAYER CYLINDRICAL SHELL WITH INCOMPRESSIBLEIDEAL LIQUID,
AD-629 297 FLD. 20/11

•STERBUTZEL, GERALD A.
• • •
A PROBE FOR THE MEASUREMENT OF HIGH SURFACETEMPERATURES,
AD-629 888 FLD. 14/2

•STERN, W. A.
• • •
THE EFFECTS OF OPTICAL PUMPING ON THERB87 MASER OSCILLATOR.
AD-629 925 FLD. 20/5

•STERNIN, HAIM
• • •
STATISTICAL METHODS OF TIME SEQUENCING.
AD-629 960 FLD. 12/1

•STEVENSON, A. F.
• • •
STUDIES OF THE DYNAMO ACTION OF THE LIQUIDCORE OF THE EARTH.
AD-629 957 FLD. 8/14

•STEVENSON, RICHARD
• • •
THE EFFECT OF PRESSURE ON THE FERROMAGNETICPHASE TRANSITION OF EUO,
AD-629 109 FLD. 20/12

•STOCKTON, J. E.
• • •
A STANDARDIZED TRANSDUCER CALIBRATIONSYSTEM FOR NAVAL SHIPYARD TRANSDUCER REPAIRFACILITIES,
AD-629 926 FLD. 14/2

•STOKES, C. S.
• • •
PLASMA JET CHEMISTRY.
AD-629 591 FLD. 20/5

•STOUT, J. W.
• • •
MAGNETIC ORDERING IN VF2.
AD-629 211 FLD. 7/4

•STRIZHEVSKAYAAND, L. G.
• • •
METHOD OF WELDING BY THE FUSING OF BETATITANIUM ALLOYS,
AD-629 069 FLD. 13/8

•STROEVA, K. M.
• • •
A STUDY OF ANTIFRICTION ALLOYS OF THE'ALCUSIP' TYPE,
AD-629 911 FLD. 11/6

•STRONG, R. A.
• • •
A SEALED SWITCH.
AD-629 922 FLD. 9/5

•STUBBS, I. R.
• • •
BLAST AND IMPACT EXPOSURE OF EXISTINGSTRUCTURAL FIRE PROTECTION SCHEMES.
AD-629 040 FLD. 13/12

•STUPNITSKAYA, V. M.
• • •
NATURAL TULAREMIA FOCI ON THE TERRITORYOF THE UKRAINIAN SSR,
AD-629 697 FLD. 6/13

•SUDAREV, A. V.
• • •
AERODYNAMICS AND HEAT TRANSFER OF A FLATTURBULENT STREAM FLOWING ALONG A FLATSURFACE,
AD-629 096 FLD. 20/4

•SUKHORUKOV, P. A.
• • •
ADDITIVE TO SULFUROUS FUELS FOR HIGH-SPEEDDIESEL ENGINES,
AD-629 296 FLD. 21/4

•SULLIVAN, JOHN J.
• • •
PRESSURE BURSTS IN BAKEABLE ULTRA-HIGHVACUUM VALVES DURING OPENING AND CLOSING.
AD-629 120 FLD. 13/11

•SULZHENKO, N. K.
• • •
METHOD OF OBTAINING LUBRICANT FOR TITANIUMPARTS,
AD-629 160 FLD. 11/8

•SUSSKIND, CHARLES
• • •
ANODE STRUCTURES FOR COLD-CATHODE HIGHPOWER MAGNETRONS.
AD-629 983 FLD. 9/1

•SUYUNSHKALIEV, N. KH.
• • •
APPROXIMATE SOLUTION OF THE PROBLEM OFBENDING OF A SHALLOW SPHERICAL SHELL WEAKENEDBY AN APERTURE,
AD-629 192 FLD. 20/11

•SVERCHKNOV, A. N.
• • •
FREEING THE AIR OF MICROFLORA UNDER THEACTION OF ARTIFICIAL AEROIONIZATION,
AD-629 659 FLD. 6/13

•SWITHENBANK, J.
• • •
INTENTIONAL COMBUSTION OSCILLATIONS INPROPULSION SYSTEMS.
AD-629 499 FLD. 21/8

•SYRKIN, V.
• • •
A CHEMICAL REACTION PRODUCES A MICROCIRCUIT.
AD-629 277 FLD. 9/1

•TABAKOFF, WIDEN
• • •
MEASUREMENT OF THE HEAT TRANSFER TO ATWO-DIMENSIONAL HYPERSONIC INLET WITHVARIABLE GEOMETRY.
AD-629 099 FLD. 20/13

•TANDON, JAI
• • •
RESEARCH ON SYNTHESIS OF UNSATURATEDFLUOROCARBON COMPOUNDS.
AD-629 867 FLD. 11/10

•TARANUKHA, O. M.
• • •
TRANSDUCER OF SPECTROMETER OF ELECTRONICPARAMAGNETIC RESONANCE,
AD-629 009 FLD. 20/6

•TARIFA, CARLOS SANCHEZ
• • •
HETEROGENEOUS COMBUSTIONS AND FLAMESSTRUCTURES.
AD-629 018 FLD. 21/2

•TARRANT, PAUL
• • •
RESEARCH ON SYNTHESIS OF UNSATURATEDFLUOROCARBON COMPOUNDS.
AD-629 867 FLD. 11/10

•TAVOLGA, WILLIAM N.
• • •
AUDITORY CAPACITIES IN FISHES: THRESHOLDVARIABILITY IN THE BLUE-STRIPED GRUNT,HAEMULON SCIURUS,
AD-629 299 FLD. 6/3

•TAYLOR, J. B.
• • •
THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM,
AD-629 967 FLD. 11/6

•TEAL, DAVID JENS
• • •
AN INVESTIGATION OF THE EFFECTS OF GRAVITYON CRATER FORMATION IN A COHESIONLESSMEDIUM.
AD-629 391 FLD. 19/4

•TEAL, GILBERT E.
• • •
TRAINING REQUIREMENTS FOR POSTATTACKADAPTIVE BEHAVIOR.
AD-629 870 FLD. 19/3

•TEBO, ALBERT
• • •
APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY,
AD-629 998 FLD. 4/2

•TELEGIN, G. S.
• • •
CALCULATION OF COMPOSITION OF EXPLOSIVESAND DETONATION PARAMETERS OF CONDENSEDEXPLOSIVES,
AD-629 190 FLD. 19/1

•TEMPLE, T. W.
• • •
MEASUREMENT OF WIND SHEAR.
AD-629 339 FLD. 4/2

•TENER, J. S.
• • •
SEASONAL ACCLIMATIZATION IN VARYING HARE(LEPUS AMERICANUS),
AD-629 996 FLD. 6/3

•TERAVSKII, I. K.
• • •
THE EFFECT OF REDUCED ATMOSPHERICPRESSURE AND SEVERAL GASES ON THE TICKSORNITHODOROS PAPILLIPES BIR.,
AD-629 693 FLD. 6/3

•TERENTEV, A. P.
• • •
SEMICONDUCTING AND OPTICAL PROPERTIES OFDITHIOCARBAMATES OF COPPER, NICKEL, ZINCAND CADMIUM,
AD-629 193 FLD. 20/12

•TETER, L. A.
• • •
THE VISCOELASTIC RELAXATION MECHANISM OFINORGANIC POLYMERS. IV. SIMULTANEOUSMULTIPLE MECHANISMS.
AD-629 329 FLD. 11/9

•THEPHUSDIN, CHAMRAS
• • •
HAEMOGLOBIN J AND E IN A THIA KINDRED.
AD-629 499 FLD. 6/5

•THOMAS, EDMUND D.
• • •
THE VALIDITY OF THE ADVANCED TECHNICANSTEST IN PREDICTING PERFORMANCE AT CLASS 'B'AND 'C' SCHOOLS.
AD-629 119 FLD. 5/9

•THOMAS, JOHN W.
• • •
OXIDATIVE STUDIES OF POLYPHENOLS,
AD-629 879 FLD. 7/3

•THOMAS, PATRICIA J.
• • •
THE VALIDITY OF THE ADVANCED TECHNICANSTEST IN PREDICTING PERFORMANCE AT CLASS 'B'AND 'C' SCHOOLS.
AD-629 119 FLD. 5/9

•THOMPSON, HUGH A.
• • •
A FLOW MODEL AND ANALYSIS OF A ROCKET PAIRIN CLOSE PROXIMITY,
AD-629 566 FLD. 19/4

•THOMSON, A. L.
• • •
EMPIRICAL INFRARED ABSORPTION COEFFICIENTSOF H2O FROM 300K TO 3000K.
AD-629 582 FLD. 21/2

•THOMSON, J. B.
• • •
INFLUENCE OF ENVIRONMENT ON ROVING ANDLAMINATE PROPERTIES,
AD-629 030 FLD. 11/5

•THUMAN, W. C.
• • •
TRANSFER OF AIR THROUGH ADSORBED SURFACEFILMS AS A FACTOR IN FOAM STABILITY.
AD-629 349 FLD. 11/11
• • •
PRIMARY ADSORPTION DURING FOAM FORMATION.
AD-629 345 FLD. 11/11
• • •
THE PHYSICAL CHEMISTRY AND STABILITY OFBUBBLES WITH SPECIAL REFERENCE TO AQUEOUSSOLUTIONS. SURFACE VISCOSITY OF DETERGENTSOLUTIONS AS A FACTOR IN FOAM STABILITY.
AD-629 346 FLD. 11/11

•TIAO, GEORGE C.
• • •
BAYESIAN COMPARISON OF MEANS OF A MIXEDMODEL WITH APPLICATION TO REGRESSION ANALYSIS.
AD-629 271 FLD. 12/1
• • •
A CHANGE IN LEVEL OF A NON-STATIONARY TIMESERIES.
AD-629 496 FLD. 12/1

•TIKHOMIROV, B. A.
• • •
THE PROBLEM OF SELECTING OPTIMUMPARAMETERS OF A DOUBLE CASCADE GASTURBINE ENGINE,
AD-629 249 FLD. 21/5

•TILL, J. E.
• • •
RADIOSENSITIVITY OF THE IMMUNE RESPONSE TOSHEEP RED CELLS IN THE MOUSE, AS MEASURED BYTHE HEMOLYTIC PLAQUE METHOD,
AD-629 902 FLD. 6/18
• • •
THE CELLULAR BASIS OF THE GENETICALLYDETERMINED HEMOPOIETIC DEFECT IN ANEMICMICE OF GENOTYPE SI/SI(D),
AD-629 923 FLD. 6/16

•TIMOFEEV, I. S.

• • •
BELLOWS TYPE DEVICE FOR HYDRAULICREMOTE CONTROL OF AN ACTUATOR,
AD-629 184 FLD. 13/7

•TING, LU
• • •
ON THE INITIAL CONDITIONS FOR BOUNDARYLAYER EQUATIONS,
AD-629 207 FLD. 20/4

•TOBOLSKY, A. V.
• • •
IONIC COPOLYMERIZATION OF STYRENE ANDP-METHYL-STYRENE.
AD-629 591 FLD. 11/9

•TOKEN, K. H.
• • •
EXPERIMENTAL INVESTIGATIONS OF HYPERSONICFLOW AROUND TWO-DIMENSIONAL CIRCULARCYLINDERS.
AD-629 384 FLD. 20/4

•TOMBOULIAN, D. H.
• • •
RESEARCH ON SOFT X-RAY ABSORPTION.
AD-629 219 FLD. 20/12

•TONLINSON, JOHN M.
• • •
A METHOD OF SOLVING THE INTEGRAL EQUATIONSFOR THE ERTICAL PROPAGATION OF TIME-HARMONICELECTROMAGNETIC PLANE WAVES IN ANISOTROPICVERTICALLY-HOMOGENEOUS MEDIA,
AD-629 609 FLD. 20/14

•TOPUNOV, A. M.
• • •
THE PROBLEM OF SELECTING OPTIMUMPARAMETERS OF A DOUBLE CASCADE GASTURBINE ENGINE,
AD-629 249 FLD. 21/5

•TORRIONE, P.
• • •
TUNABLE SOLID STATE GENERATOR.
AD-629 310 FLD. 9/5

•TRAVIS, D. N.
• • •
ABSORPTION SPECTRUM OF THE CCN RADICAL,
AD-629 968 FLD. 7/4

•TROSHIN, YA. K.
• • •
ON DETONATION COMBUSTION OF HETEROGENEOUSSYSTEMS,
AD-629 158 FLD. 19/4

•TRUELL, RHON
• • •
PHYSICAL RESEARCH ON PROPERTIES OF II-VICOMPOUND SEMI CONDUCTORS.
AD-629 976 FLD. 20/12

•TUMANOV, V. I.
• • •
MUTUAL SOLUBILITY OF COPPER AND MOLYBDENUMAND CERTAIN PROPERTIES OF ALLOYS OF MOLYBDENUMWITH COPPER,
AD-629 908 FLD. 11/6

•TUNG, FRANK
• • •
AN OPTIMAL DISCRETE CONTROL STRATEGY FORINTER-PLANETARY GUIDANCE.
AD-629 982 FLD. 22/3

•TUNG-HSIANG, JEANETTE
• • •
HAEMOGLOBIN J AND E IN A THIA KINDRED.
AD-629 959 FLD. 6/5

•TURNBULL, DAVID
• • •
PROGRESS REPORT NO. 2, SEPTEMBER 1, 1964SEPTEMBER 1, 1965,
AD-629 921 FLD. 20/2

•TURNER, B. R.
• • •
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERICGASES.
AD-629 480 FLD. 4/1

•TURNER, D. M.
• • •
THE EFFECT OF SIMULATED FISSION PRODUCTS INTHE INTER-ELECTRODE SPACING OF A THERMIONICDIODE.
AD-629 986 FLD. 18/10

•TYLKINA, M. A.
• • •
PROPERTIES AND USES OF RHENIUM,
AD-629 909 FLD. 11/6

•ULLIAN, JOSEPH
• • •
FAILURE OF A CONJECTURE ABOUT CONTEXTFREE LANGUAGES,
AD-629 939 FLD. 9/2

•UMARKHODZHAEV, R. M.
• • •
METHOD OF GENERATING OSCILLATIONS WITH AFREQUENCY WHICH IS DETERMINED BY THELARMOR PRECESSION FREQUENCY OF NUCLEARSPINS,
AD-629 071 FLD. 9/5

•URETSKY, J. L.
• • •
THE SCATTERING OF PLANE WAVES FROMPERIODIC SURFACES,
AD-629 986 FLD. 20/1

•USANOV, V. V.
• • •
INFLUENCE OF HEAT TREATMENT ON THEPHYSICOMECHANICAL PROPERTIES OF STEELS OF THEAUSTENITE-MARTENSITE CLASS,
AD-629 293 FLD. 11/6

•VAINSHTEIN, B. I.
• • •
IMPROVEMENT OF METHODS FOR MEASURINGDETONATION RATES,
AD-629 609 FLD. 14/2

•VAISHNAV, RAMESH N.
• • •
FINITE DEFORMATIONS UNDER PRESSURIZATION INAN INFINITELY LONG, THICK-WALLED, NONLINEARLYVISCOELASTIC CYLINDER IDEALLY BONDED TO A THINELASTIC CASE.
AD-629 219 FLD. 20/11

•VALGIN, V. D.
• • •
PRODUCTION PROCESS FOR FOAM PLASTICS,
AD-629 168 FLD. 11/9

•VANCE, EDWARD F.
• • •
CORRELATION BETWEEN CLEAR-AIR TURBULENCEAND AIRCRAFT ELECTRICAL ACTIVITY.
AD-629 309 FLD. 4/1

•VAN DEN BRINK, GERT
• • •
VISUAL LOCALIZATION OF THE HORIZONTAL ASA FUNCTION OF BODY TILT UP TO = 90 DEGREESFROM GRAVITATIONAL VERTICAL,
AD-629 266 FLD. 6/19

•VAN DYCK, ROBERT
• • •
THE EFFECT OF WAVES, LOADING, AND CONFIGURATION ON THE TAKE-OFF PERFORMANCE OF WATERBASED AIRCRAFT,
AD-629 268 FLD. 1/2

•VAN METER, J. P.
• • •
THE PHOTOLYTIC DECOMPOSITION OF SOMESULFONES BY AN INTERNALLY SENSITIZED PATH,
AD-629 638 FLD. 7/3

•VAN NOSTRAND, ROBERT G.
• • •
SEISMIC DATA LABORATORY.
AD-629 947 FLD. 8/11

•VAN SCHMUS, RANDALL
• • •
SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARYCHONDRITES.
AD-629 165 FLD. 8/7

•VAN VALKENBURG, MAC E.
• • •
SET OF CUT SETS AND OPTIMUM FLOW,
AD-629 200 FLD. 9/1

•VARDYA, M. S.
• • •
THERMODYNAMICS OF A SOLAR COMPOSITIONGASEOUS MIXTURE,
AD-629 939 FLD. 3/2

•VEKSLER, E. YA.
• • •
ULTRASONIC DEFECTOSCOPY OF TUBES,
AD-629 229 FLD. 13/8

•VENTSEL, S. V.
• • •
EFFECT OF OIL OXIDATION ON THE PROCESS OFRUNNING-IN A RING-SOCKET PAIR IN AN INTERNALCOMBUSTION ENGINE,
AD-629 910 FLD. 21/7

•VERES, SANDOR A.
• • •
INVESTIGATION OF FUSION AND FIXATION DISPARITYLIMITS FOR PHOTOGRAMMETRY.
AD-629 217 FLD. 5/10

•VERHOEFF, J.
• • •
USE OF META-LANGUAGE IN INFORMATIONRETRIEVAL SYSTEMS,
AD-629 977 FLD. 9/2

•VIDMAR, NEIL J.
• • •
ROLE ASSIGNMENT AND ATTITUDINAL COMMITMENT AS FACTORS IN NEGOTIATION.
AD-629 387 FLD. 5/10

•VIIL, HEINO
• • •
THE DEFINITION OF REQUIREMENTS FOR A SEALAUNCHED MISSILE INFORMATION-ANALYSISCENTER.
AD-629 193 FLD. 9/2

•VIRKUS, A. YU.
• • •
GAS-LIQUID CHROMATOGRAPHY OF METHYLETHERS OF HIGHER FATTY ACIDS OF SENDAIVIRUS LIPID COMPONENT,
AD-629 626 FLD. 6/1

•VLASOV, A. V.
• • •
THE SYNTHESIS OF A SEMI-CONDUCTING COMBINATION OF MATERIALS BY THE METHOD OF RADIATIONOF GASEOUS PHASE INFUSED POLYMERIZATION,
AD-629 912 FLD. 11/9

•VLODAVETS, V. V.
• • •
DYNAMICS OF A BACTERIAL AEROSOL IN

THE DUSTAND DROP PHASE.
AD-625 615 FLD. 19/2

• • •

THE POSSIBILITY OF USING B PRODIGIOSUMAS AN EXPERIMENTAL BACTERIAL AEROSOL MODEL.
AD-625 616 FLD. 6/13

•VOGE, MARIETTA

• • •

HOST PRECIPITIN ANTIBODY PRODUCTION INRELATION TO DIFFERENTIATION AND GROWTH OFPARASITIC ROUNDWORMS.
AD-625 025 FLD. 6/3

•VOGEL, HARVEY

• • •

AN INVENTORY OF GEOGRAPHIC RESEARCH OFTHE HUMID TROPIC ENVIRONMENT. VOLUME I.KWIC INDEX. HUMID TROPIC ENVIRONMENTALLITERATURE,
AD-625 926 FLD. 8/6

•VOLPERT, E. G.

• • •

CALCULATING THE INTERDEPENDENCE OFMACHINE SUBASSEMBLIES IN DETERMININGRELIABILITY,
AD-625 301 FLD. 14/4

•VON ENGEL, A.

• • •

INVESTIGATION OF THE PROPERTIES OF HOTPLASMA GASES AND MEASUREMENT OF GASTEMPERATURES NEAR SOLID SURFACES.
AD-625 043 FLD. 20/9

•VOYUSKII, S. S.

• • •

THE INVALIDITY OF A PURELY THERMODYNAMICTREATMENT OF THE ADHESION OF SOLIDS,
AD-625 603 FLD. 7/4

•VOZKHENNIKOV, V. M.

• • •

SEMICONDUCTING AND OPTICAL PROPERTIES OFDITHIOCARBAMATES OF COPPER, NICKEL, ZINCAND CADMIUM,
AD-625 153 FLD. 20/12

•WAELSCH, HEINRICH

• • •

RESEARCH ON THE METABOLISM OF GLUTATHIONE,GLUTAMINE, AND RELATED COMPOUNDS.
AD-625 494 FLD. 6/16

•WAIT, JAMES R.

• • •

PROPAGATION OF PULSES IN DISPERSIVE MEDIA.
AD-625 139 FLD. 20/14

•WALKER, CRAYTON C.

• • •

A STUDY OF A FAMILY OF COMPLEX SYSTEMS:AN APPROACH TO THE INVESTIGATION OF ORGANISMSBEHAVIOR.
AD-624 864 FLD. 6/4

•WALKER, ROBERT L.

• • •

DESIGN, DEVELOPMENT AND FLIGHT TEST RESULTSOF THE LOKI INSTRUMENTED DART SYSTEM.
AD-625 481 FLD. 4/2

•WALL, JAMES A.

• • •

INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIES IN ORGANIC AND INORGANICMATERIALS.
AD-624 884 FLD. 20/12

•WALLSTON, R. A.

• • •

PERFORMANCE OF THE AN/GMD-2 RAWIN SETIN THE DENPRO SYSTEM.
AD-625 118 FLD. 14/2

•WALTERS, L. C.

• • •

OPTIMUM NONUNIFORMLY SPACED ANTENNAARRAYS.
AD-625 318 FLD. 9/5

•WANG, S. T.

• • •

CONCENTRATION DEPENDENCE OF SPIN-LATTICERELAXATION TIME OF COLOR CENTERS IN QUARTZ,
AD-625 098 FLD. 20/2

•WARD, J. H. R.

• • •

SIMPLE APPARATUS FOR APPLYING UNIAXIALPRESSURE AT VERY LOW TEMPERATURES,
AD-625 020 FLD. 14/2

•WARE, ROBERT

• • •

A COGNITIVE DETERMINANT OF IMPRESSIONFORMATION.
AD-625 019 FLD. 5/10

•WASHINGTON, WARREN M.

• • •

INITIALIZATION OF PRIMITIVE-EQUATION MODELSFOR NUMERICAL WEATHER PREDICTION.
AD-625 348 FLD. 4/2

•WATSON, M. D.

• • •

PERIODICALLY ADJUSTED FEEDBACK CONTROLSMULTIPLIER PHOTOTUBE,
AD-624 955 FLD. 9/5

•WEAVER, R. S.

• • •

THEORETICAL ASPECTS OF THE ROLE OF ANGULARACCELERATION IN VESTIBULAR STIMULATION.
AD-625 434 FLD. 6/19

•WEBSTER, J. C.

• • •

SPEECH INTERFERENCE ASPECTS OF NAVYNOISES. CALCULATIONS SHOW SPEECH INTERFERENCE MEASUREMENTS ARE SIMPLIFIED BYAVERAGING SOUND PRESSURE LEVELS IN MIDFREQUENCY OCTAVES.
AD-625 262 FLD. 5/5

•WEDUM, ARNOLD G.

• • •

RECOVERY OF SPECIFIC MICROORGANISMSFROM URINE AND FECES OF INFECTED ANIMALS,
AD-625 256 FLD. 6/13

•WEICKMANN, HELMUT K.

• • •

APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY,
AD-624 948 FLD. 4/2

•WEINBERG, STEVEN

• • •

PHOTONS AND GRAVITONS IN PERTURBATIONTHEORY: DERIVATION OF MAXWELL'S ANDEINSTEIN'S EQUATIONS.
AD-625 962 FLD. 20/10

• • •

COMMENTS ON RELATIVISTIC SUPERMULTIPLETTHEORIES,
AD-625 973 FLD. 20/8

•WEITZMAN, DONALD O.

• • •

LIGHTING SURVEY OF U.S.S. DOGFISH (SS350).
AD-625 259 FLD. 13/10

•WELLS, MICHAEL B.

• • •

MONTE CARLO CODES FOR STUDY OF LIGHTTRANSPORT IN THE ATMOSPHERE. VOLUME I:DESCRIPTION OF CODES.
AD-625 115 FLD. 20/6

• • •

MONTE CARLO CODES FOR STUDY OF LIGHTTRANSPORT IN THE ATMOSPHERE. VOLUME II:UTILIZATION INSTRUCTIONS.
AD-625 116 FLD. 20/6

•WENDLANDT, WESLEY W.

• • •

THERMODILATOMETRIC ANALYSIS: SOMECHEMICAL APPLICATIONS,
AD-625 589 FLD. 7/4

•WERTZ, J. E.

• • •

POINT DEFECTS IN MAGNESIUM OXIDE,
AD-625 590 FLD. 20/12

•WERTZ, JOHN E.

• • •

OXIDATIVE STUDIES OF POLYPHENOLS.
AD-624 875 FLD. 7/3

• • •

NUCLEAR MAGNETISM,
AD-625 548 FLD. 20/8

•WESSEL, G.

• • •

ANTIFERROMAGNETIC SPIN RESONANCE OFCOBR2.6H2O,
AD-625 539 FLD. 20/3

•WHALLEY, E.

• • •

ENTROPY CHANGES AT THE PHASE TRANSITIONSIN ICE,
AD-624 974 FLD. 7/4

•WHEATON, R.

• • •

EFFECT OF EXPOSURE TO OXYGEN ON CHANGESIN MEATS AND VEGETABLES DURING STORAGE.
AD-625 484 FLD. 6/8

•WHITELEY, J. W.

• • •

A STANDARDIZED TRANSDUCER CALIBRATIONSYSTEM FOR NAVAL SHIPYARD TRANSDUCER REPAIRFACILITIES,
AD-624 926 FLD. 14/2

•WHITTINGHAM, C. P.

• • •

PHOTOSYNTHETIC MECHANISMS UNDER SUB-OPTIMAL CONDITIONS.
AD-625 495 FLD. 6/1

•WICK, E. L.

• • •

STUDIES OF BEEF IRRADIATION FLAVOR USING ACONCURRENT RADIATION-DISTILLATION TECHNIQUE.
AD-624 994 FLD. 6/8

•WILCOX, JOHN M.

• • •

SOLAR SYSTEM MAGNETIC FIELDS AND PLASMAS.
AD-625 178 FLD. 3/2

•WILCOXSON, W. L.

• • •

AN IMPROVED STEPWISE REGRESSION ANALYSISPROCEDURE.
AD-625 328 FLD. 12/1

•WILES, D. M.

• • •

TACTICITY DETERMINATIONS ON ALLYLMETHACRYLATE POLYMERS.
AD-624 977 FLD. 11/9

•WILKINSON, G.

• • •

TRANSITION-METAL CARBON CHEMISTRY.
AD-624 988 FLD. 7/2

•WILLIAMS, WALTER J.

• • •

BALLOON BORNE INFRARED STUDIES.
AD-625 349 FLD. 4/1

•WILLIS, D. ROGER
• • •
SPHERE DRAG AT HIGH KNUDSEN NUMBER ANDLOW MACH NUMBER.
AD-625 622 FLD. 20/4

•WILLOUGHBY, WILLIAM F.
• • •
ANTIBODY-COMPLEMENT COMPLEXES,
AD-624 873 FLD. 6/13

•WINCHESTER, JOHN W.
• • •
GEOCHEMISTRY OF IODINE, BROMINE, ANDCHLORIDE IN THE AIR-SEA-SEDIMENT SYSTEM,
AD-625 314 FLD. 8/8

•WODINSKY, JEROME
• • •
AUDITORY CAPACITIES IN FISHES: THRESHOLDVARIABILITY IN THE BLUE-STRIPED GRUNT,HAEMULON SCIURUS,
AD-625 299 FLD. 6/3

•WOHLEVER, J. R.
• • •
AN IMPROVED STEPWISE REGRESSION ANALYSISPROCEDURE.
AD-625 328 FLD. 12/1

•WOJCIK, WALTER
• • •
APPLICATION AND VERIFICATION OF MATHEMATICALMODEL OF PHOTOGRAPHIC RECONNAISSANCE.
AD-625 319 FLD. 15/7

•WOLFF, S. S.
• • •
THE SIGN TEST ON AUTOREGRESSIVE DATA.
AD-625 272 FLD. 12/1

•WOLKOVITCH, J.
• • •
AN ANALYTICAL STUDY OF V/STOL HANDLINGQUALITIES IN HOVER AND TRANSITION.
AD-625 999 FLD. 1/2

•WOLTMAN, H. R.
• • •
THE ECONOMIC FEASIBILITY OF DECENTRALIZEDMETROPOLITAN REGIONS.
AD-625 172 FLD. 15/3

•WONG, P. K.
• • •
HARMONIC WAVE PROPAGATION IN ELASTIC RODS OFELLIPTICAL CROSS-SECTION.
AD-625 908 FLD. 20/11

•WOOD, J. S.
• • •
THE CRYSTAL AND MOLECULAR STRUCTURE OFPENTAKIS(METHYLISONITRILE)COBALT(I) PERCHLORATE,
AD-625 639 FLD. 7/4

•WOODFILL, BARBARA
• • •
THE ECONOMIC FEASIBILITY OF DECENTRALIZEDMETROPOLITAN REGIONS.
AD-625 172 FLD. 15/3

•WRIGHTAND, G. B.
• • •
MAGNETIC PROPERTIES OF INAS DIODEELECTROLUMINESCENCE,
AD-624 878 FLD. 20/3

•WRZESINSKY, R. G.
• • •
INTERACTION OF THREE HYDROGEN ATOMS.
AD-625 900 FLD. 20/8

•WYATT, C. L.
• • •
DUAL-CHANNEL SATELLITE RADIOMETER
AD-625 380 FLD. 17/5

•YAMBURENKO, V. S.
• • •
ADDITIVE TO SULFUROUS FUELS FOR HIGH-SPEEDDIESEL ENGINES,
AD-625 296 FLD. 21/4

•YANOVSKII, A. A.
• • •
FROM OARS TO THE WATER-JET,
AD-625 910 FLD. 13/10

•YANTOVSKII, E. I.
• • •
RADIAL FLOW OF AN ELECTROCONDUCTI' GASIN A MOVING MAGNETIC FIELD,
AD-624 919 FLD. 10/2

•YARNOLD, KENNETH W.
• • •
SYSTEMS ANALYSIS OF AAW TRAINING REQUIREMENTS.
AD-625 378 FLD. 5/9

•YATES, R. E.
• • •
THERMODYNAMIC PROPERTIES OF ROCKET EXHAUSTPRODUCTS.
AD-625 598 FLD. 21/9

•YAU, S. S.
• • •
A NOTE ON THE RELIABILITY OF COMMUNICATIONNETWORKS.
AD-625 692 FLD. 14/4

•YEAMANS, NORMAN L.
• • •
FURTHER STUDIES ON HYDROGEN AND DEUTERIUMCLEANUP,
AD-625 389 FLD. 9/1

•YEH, K. C.
• • •
THE RATE AND PATTERN OF INDUSTRIAL GROWTHIN COMMUNIST CHINA,
AD-624 902 FLD. 5/3

•YOUNG, DAVID M.
• • •
DISCRETE REPRESENTATIONS OF PARTIALDIFFERENTIAL OPERATORS.
AD-625 654 FLD. 12/1

•WOOLCOTT, R. L. S.
• • •
ENERGY ESTIMATION FOR HIGH-ENERGY NUCLEARINTERACTIONS,
AD-625 949 FLD. 20/8

•WRIGHT, ALAN
• • •
RESEARCH ON SYNTHESIS OF UNSATURATEDFLUOROCARBON COMPOUNDS.
AD-624 867 FLD. 11/10

•YOUNG, FRANCIS A.
• • •
THE REFRACTIVE CHARACTERISTICS ANDINTRAOCULAR TENSIONS OF COLONYCHIMPANZEES,
AD-625 333 FLD. 6/3

•YOUNG, ROBERT L.
• • •
RHEOLOGICAL PROPERTIES OF GREASES OVERWIDE TEMPERATURE RANGES.
AD-625 136 FLD. 11/8

•YUAN, S.
• • •
TUNABLE SOLID STATE GENERATOR.
AD-625 310 FLD. 9/5

•YUNUSOV, M.
• • •
EFFECT OF GAMMA RADIATION ON THE FLUORESCENT YIELD OF RUBY,
AD-625 294 FLD. 20/2

•ZABLODIL, R. J.
• • •
COLLECTIVE PROTECTOR DESIGN AND DEVELOPMENT.
AD-625 902 FLD. 13/13

•ZANSOKHOV, V. B.
• • •
MOUNTING DEVICE FOR CAISSON PUMPS,
AD-625 141 FLD. 13/11

•ZAZOVSKAYA, I. A.
• • •
MOSAIC STRUCTURE OF METALLIC POLYCRYSTALSAND EXTINCTION EFFECTS,
AD-625 249 FLD. 20/2

•ZENIN, V. N.
• • •
IMPROVEMENT OF METHODS FOR MEASURINGDETONATION RATES,
AD-625 605 FLD. 14/2

•ZHELTIKOV, I.
• • •
WAR AND WEATHER,
AD-625 195 FLD. 15/7

•ZINGELMANN, W. J.
• • •
DETERMINATION OF EQUIVALENCE BETWEENRADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CURED MEATS.
AD-625 292 FLD. 6/8

•ZRELOV, V. N.
• • •
CHARACTERISTICS OF MICROCONTAMINATIONS INAVERAGE DISTILLATE FUELS,
AD-625 149 FLD. 21/5

•ZUBAREV, V. N.
• • •
CALCULATION OF COMPOSITION OF EXPLOSIVESAND DETONATION PARAMETERS OF CONDENSEDEXPLOSIVES,
AD-625 150 FLD. 19/1

•ZUBEK, J. P.
• • •
AUDITORY SENSITIVITY AFTER PROLONGEDVISUAL DEPRIVATION,
AD-625 928 FLD. 6/16

•ZURICHENKO, ALEX
• • •
HIGH-PURITY METALS: ANNOTATED BIBLIOGRAPHY.
AD-624 997 FLD. 11/6

# CORPORATE AUTHOR - MONITORING AGENCY INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper).


•ACADIA UNIV WOLFVILLE (NOVA SCOTIA)
• • •
RADAR AND GEOLOGY.
(AFCRL-69-202)
AD-629 887 FLD. 8/2

•ADAMS (CHARLES W) ASSOCIATES INC CAMBRIDGE MASS
• • •
RESEARCH ON ADVANCED DYNAMIC ATTRIBUTEEXTRACTION TECHNIQUES.
(AFCRL-69-736)
AD-629 181 FLD. 9/2

•AEROCHEM RESEARCH LABS INC PRINCETON N J
• • •
TRANSPIRATION COOLING WITH CHEMICALREACTIONS,
(AFOSR-69-2266)
AD-629 367 FLD. 20/13

•AEROMEDICAL RESEARCH LAB (6971ST) HOLLOMAN AFB N MEX
• • •
ARL-TR-69-23
THE REFRACTIVE CHARACTERISTICS ANDINTRAOCULAR TENSIONS OF COLONYCHIMPANZEES,
AD-629 333 FLD. 6/3

•AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF
• • •
QLR-69-19
THERMODYNAMIC PROPERTIES OF PROPELLANTCOMBUSTION PRODUCTS.
AD-629 044 FLD. 21/2

•AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
• • •
ARL-69-129
PHYSICAL RESEARCH ON PROPERTIES OF II-VICOMPOUND SEMI CONDUCTORS.
AD-629 476 FLD. 20/12
• • •
ARL-69-181
COMPARISON OF TRANSIENT COMPRESSORS FORTHE PRODUCTION OF HIGH TEMPERATURE ANDHIGH DENSITY GASES.
AD-629 570 FLD. 7/1
• • •
ARL-69-182
CALCULATION OF THE FORCE COEFFICIENT FORDELTA WINGS IN HYPERSONIC FLOW.
AD-629 904 FLD. 20/4
• • •
ARL-69-183
EXPERIMENTAL AND ANALYTICAL STUDIES INCONTINUUM HYPERSONIC FLOW.
AD-629 209 FLD. 20/4
• • •
ARL-69-202
THE WAVE NATURE OF MOVING STRIATIONS,
AD-629 189 FLD. 20/9
• • •
ARL-69-207
REVIEW OF THEORETICAL ANALYSES OF ARCHEATING IN A TUBE,
AD-629 558 FLD. 20/9
• • •
ARL-69-208
ON THE INITIAL CONDITIONS FOR BOUNDARYLAYER EQUATIONS,
AD-629 207 FLD. 20/4
• • •
ARL-69-210
AN APPROXIMATE SOLUTION OF THE CROCCOEQUATION,
AD-629 206 FLD. 12/1
• • •
ARL-69-211
RADIATIVE HEAT TRANSFER BETWEEN PARALLELPLATES SEPARATED BY A NON-ISOTHERMALMEDIUM ANISOTROPIC SCATTERING.
AD-629 203 FLD. 20/13
• • •
ARL-69-212
EXPERIMENTAL INVESTIGATIONS OF HYPERSONICFLOW AROUND TWO-DIMENSIONAL CIRCULARCYLINDERS.
AD-629 384 FLD. 20/4
• • •
ARL-69-214
OBSERVED SUPERSATURATION IN THE ARL 20-INCHHYPERSONIC WIND TUNNEL.
AD-629 253 FLD. 14/2
• • •
ARL-69-219
AERODYNAMIC PERFORMANCE OF REVERSEDFLOW VORTEX CHAMBERS.
AD-629 909 FLD. 14/2
• • •
ARL-69-248
STUDIES IN PERTURBATION THEORY. XI. LOWERBOUNDS TO ENERGY EIGENVALUES, GROUND STATEAND EXCITED STATES,
AD-629 369 FLD. 20/10
• • •
ARL-69-249
LOWER BOUNDS FOR THE EIGENVALUES OF FIRSTORDER DENSITY MATRICES,
AD-629 212 FLD. 7/4
• • •
ARL-69-250
THE INDEPENDENT PARTICLE MODEL FOR MANYELECTRON SYSTEM. II. SYMMETRY PROPERTIES ANDCRITERIA FOR THE VALIDITY OF THE INDEPENDENTPARTICLE MODEL.
AD-629 213 FLD. 7/4
• • •
ARL-69-251
THE INTERACTION POTENTIAL SURFACE FOR H3.
AD-629 214 FLD. 7/4
• • •
ARL-69-252
THEORY OF INTERNAL RELAXATION IN CHEMICALKINETICS,
AD-629 377 FLD. 7/4
• • •
ARL-69-256
DIFFERENT BANDS FOR DIFFERENT SPINS. I. THECOHESIVE ENERGY OF AN ALKALI METAL. II. APPLICATION TO A LINEAR CHAIN OF HYDROGEN ATOMS.CRYSTAL INTEGRALS AND MOLECULAR INTEGRALS,
AD-629 911 FLD. 7/4
• • •
ARL-69-257
COUPLING BETWEEN THE ENERGY GAP ANDSINGLE PARTICLE ENERGY FOR NUCLEAR MATTER,
AD-629 398 FLD. 20/8
• • •
ARL-69-258
CONCERNING THE ROOTS OF A POLYNOMIAL WHICHCONTAIN A PERTURBATION PARAMETER,
AD-629 912 FLD. 12/1
• • •
ARL-TR-69-11
SURVEY OF EXISTING METHODS OF FEEDING ANDHOUSING THE CHIMPANZEE.
AD-629 101 FLD. 6/3

•AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
• • •
FOREIGN SCIENCE BULLETIN, 1969, VOL. 1, NO. 12.
AD-629 340 FLD. 5/1
• • •
I
STRUCTURE OF ORGANIC CRYSTALS.
(TT-65-64858)
AD-629 079 FLD. 20/2
• • •
ATD-65-77
STRUCTURE OF ORGANIC CRYSTALS.
(TT-65-64858)
AD-629 079 FLD. 20/2
• • •
ATD-69-86
RESEARCH ON F-VALUES: COMPREHENSIVEREPORT.
(TT-65-64829)
AD-629 996 FLD. 7/4
• • •
ATD-69-91 2
PHOTOIONIZATION IN GASES.
(TT-66-60084)
AD-629 312 FLD. 20/3
• • •
ATD-69-107
LIFE SUPPORT SYSTEMS, PHOTOSYNTHESIS:ANALYTICAL SURVEY.
(TT-66-60098)
AD-629 263 FLD. 6/11
• • •
ATD-69-109
HIGH-PURITY METALS: ANNOTATED BIBLIOGRAPHY.
(TT-69-64830)
AD-629 997 FLD. 11/6
• • •
ATD-69-110
EFFECT OF IONIZING RADIATION ON ANIMALS ANDPLANTS,
(TT-69-64828)
AD-629 934 FLD. 6/18
• • •
ATD-69-111
THE THEORY OF DETONATION, THE COMBUSTIONMECHANISM, AND THE PROPERTIES OF EXPLOSIVES,
(TT-66-60085)
AD-629 326 FLD. 19/4
• • •
ATD-69-112
MATERIALS FOR HIGH-TEMPERATURE ENERGYCONVERTERS: ANNOTATED BIBLIOGRAPHY.
(TT-66-60097)
AD-629 198 FLD. 10/1

•AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO
• • •
AFAPL-TR-69-110
HEATS OF FORMATION OF METALLIC BORIDESBY FLUORINE BOMB CALORIMETRY.
AD-629 336 FLD. 7/4
• • •
APL-TR-69-113
INVESTIGATION OF FAULT DIAGNOSIS BY TRANSFERFUNCTION TECHNIQUES.
AD-629 987 FLD. 9/3
• • •
APL-TR-69-118
LUBRICATION RESEARCH FOR AERO PROPULSIONSYSTEMS.
AD-629 985 FLD. 11/8

•AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO
• • •
AFAL-TR-69-251
THEORETICAL ERROR OF THE AUTOMATIC SOUNDDERIVATIVE DEVICE.
AD-629 012 FLD. 14/2
• • •
AFAL-TR-69-252
SWITCHING BEHAVIOR OF FERROELECTRICBI4TI3012.
AD-629 013 FLD. 20/3
• • •
AFAL-TR-69-269
ANALYSIS OF THIN FILMS OF TANTALUMREACTIVELY SPUTTERED IN NITROGEN ATMOSPHERE.
AD-629 989 FLD. 7/2

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS
• • •
AFCRL-69-1009-P2
OBJECTIVE CROSS-SECTION ANALYSIS.
AD-629 137 FLD. 9/1

• • •

AFCRL-69-1009-PT-1
INITIALIZATION OF PRIMITIVE-EQUATION MODELSFOR NUMERICAL WEATHER PREDICTION.
AD-629 348 FLD. 4/2

• • •

AFCRL-69-202
RADAR AND GEOLOGY.
AD-629 887 FLD. 8/2

• • •

AFCRL-69-285
EXPERIMENTAL INVESTIGATION OF THE COHERENCEDISTANCE OF THE ATMOSPHERE FOR MICROWAVES.
AD-629 991 FLD. 20/14

• • •

AFCRL-69-918
DETERMINISTIC CONTEXT FREE LANGUAGES,
AD-629 938 FLD. 9/2

• • •

AFCRL-69-938
PROPAGATION OF PULSES IN DISPERSIVE MEDIA.
AD-629 139 FLD. 20/14

• • •

AFCRL-69-991
DUAL-CHANNEL SATELLITE RADIOMETER.
AD-629 380 FLD. 17/5

• • •

AFCRL-69-979
ORBIT DETERMINATION AND ANALYSIS BY THEMINIMUM VARIANCE METHOD.
AD-629 983 FLD. 22/3

• • •

AFCRL-69-609
STUDIES OF THE DYNAMO ACTION OF THE LIQUIDCORE OF THE EARTH.
AD-629 957 FLD. 8/14

• • •

AFCRL-69-619
CORRELATION BETWEEN CLEAR-AIR TURBULENCEAND AIRCRAFT ELECTRICAL ACTIVITY.
AD-629 309 FLD. 4/1

• • •

AFCRL-69-629
OZONE AND TEMPERATURE STRUCTURE IN AHURRICANE.
AD-629 123 FLD. 4/2

• • •

AFCRL-69-665
RESEARCH ON SELECTED MICROWAVE PROPERTIESOF FERRITES.
AD-629 319 FLD. 20/1

• • •

AFCRL-69-668
MODAL ANALYSIS AND SYNTHESIS OFELECTROMAGNETIC FIELDS.
AD-629 362 FLD. 20/3

• • •

AFCRL-69-677
CHARACTERISTIC FREQUENCIES FROM INFRAREDAND ELASTIC DATA.
AD-629 166 FLD. 20/12

• • •

AFCRL-69-698
ELECTRON CAPTURE FROM ATOMIC NITROGENAND OXYGEN BY PROTONS.
AD-629 138 FLD. 20/8

• • •

AFCRL-69-702
ON TRANSIENT WAVE PROPAGATION IN A PLASMA.
AD-629 133 FLD. 20/14

• • •

AFCRL-69-704
A SYSTEM FOR THE DETERMINATION OF THEVERTICAL WIND PROFILE FROM AN AIRCRAFT.
AD-629 188 FLD. 4/2

• • •

AFCRL-69-706
HYDROMAGNETIC IONIZING WAVES.
AD-629 171 FLD. 20/9

• • •

AFCRL-69-708
ROCKET SPECTRA OF THE CHROMOSPHERE.
AD-629 134 FLD. 3/2

• • •

AFCRL-69-720
INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIES IN ORGANIC AND INORGANICMATERIALS.
AD-629 884 FLD. 20/12

• • •

AFCRL-69-726
THE AFCRL 29-FT MILLIMETER-WAVE ANTENNA.
AD-629 170 FLD. 9/5

• • •

AFCRL-69-728
MINIMAX DETECTION STATION PLACEMENT.
AD-629 135 FLD. 19/7

• • •

AFCRL-69-736
RESEARCH ON ADVANCED DYNAMIC ATTRIBUTEEXTRACTION TECHNIQUES.
AD-629 181 FLD. 9/2

• • •

AFCRL-69-743
AN ATTEMPT TO REDUCE THE GAS LOAD IN ANULTRAHIGH-VACUUM CHAMBER.
AD-629 132 FLD. 14/2

• • •

AFCRL-69-744
SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARYCHONDRITES.
AD-629 169 FLD. 8/7

• • •

AFCRL-69-745
SOLAR XUV SPECTRUM OF MARCH, 1969.
AD-629 131 FLD. 3/2

• • •

AFCRL-69-746
ABSOLUTE INTENSITY MEASUREMENTS IN THEEXTREME ULTRAVIOLET SPECTRUM OF SOLARRADIATION.
AD-629 124 FLD. 20/6

• • •

AFCRL-69-749
EFFECTS OF EXPERIMENTAL PARAMETERS ONTHERMOLUMINESCENCE OF A TYPE II-A DIAMOND.
AD-629 169 FLD. 20/12

• • •

AFCRL-69-755
BALLOON BORNE INFRARED STUDIES.
AD-629 349 FLD. 4/1

• • •

AFCRL-69-757
A LARGE, LOW-COST STEERABLE PLANAR ARRAY.
AD-629 880 FLD. 9/5

• • •

AFCRL-69-769
ON MEASURING THE RADAR CROSS SECTIONS OFDUCKS AND CHICKENS.
AD-629 163 FLD. 17/9

• • •

AFCRL-69-784
MICROWAVE MEASUREMENTS OF PARTIALLYCOHERENT FIELDS.
AD-629 128 FLD. 20/14

• • •

AFCRL-69-792
FREE VIBRATIONS OF THE EARTH AND THEPROPERTIES OF ITS DEEP INTERIOR REGIONS.PART I. DENSITY.
AD-629 308 FLD. 8/7

• • •

AFCRL-69-797
ALGORITHMIC LANGUAGES PROJECT.
AD-629 940 FLD. 9/2

• • •

AFCRL-69-802
MICROELECTRONIC AMPLIFIERS HAVING MINIMUMSENSITIVITY TO ARBITRARY PARAMETER CHANGES,
AD-629 379 FLD. 9/1

• • •

AFCRL-69-803
STEADY-STATE AND TRANSIENT RESPONSE OFARBITRARY TAPERED DISTRIBUTED RC NETWORKSWITH LUMPED LOAD TERMINATIONS.
AD-629 392 FLD. 9/5

• • •

AFCRL-69-805
THE ALGEBRA OF BLOCK DIAGRAMS,
AD-629 081 FLD. 12/1

• • •

AFCRL-69-806
FAILURE OF A CONJECTURE ABOUT CONTEXTFREE LANGUAGES,
AD-629 939 FLD. 9/2

• • •

AFCRL-69-808
THE CONTROL OF ELECTROMAGNETIC SCATTERINGBY IMPEDANCE LOADING.
AD-629 122 FLD. 20/14

• • •

AFCRL-69-809
A LOOK INTO THE FUTURE OF RADAR SCATTERINGRESEARCH AND DEVELOPMENT.
AD-629 169 FLD. 17/9

• • •

AFCRL-69-810
SUBSTITUTED PERINAPHTHENYL ANION RADICALS.
AD-629 121 FLD. 7/3

• • •

AFCRL-69-815
THE CESIUM IONIZATION CROSS SECTION FROMTHRESHOLD TO 90 EV.,
AD-629 981 FLD. 7/4

• • •

AFCRL-69-830
OPTIMUM NONUNIFORMLY SPACED ANTENNAARRAYS.
AD-629 318 FLD. 9/5

• • •

AFCRL-69-841
CLASSIFICATION OF SOLAR PROMINENCES FORSUNSPOT CYCLE NO. 19 - 1962,
AD-629 381 FLD. 3/2

• • •

AFCRL-69-842
ELECTRON THERMAL DIFFUSIVITY IN RARE-GASAFTERGLOW PLASMAS,
AD-629 082 FLD. 20/9

• • •

AFCRL-69-844
DESIGN, DEVELOPMENT AND FLIGHT TEST RESULTSOF THE LOKI INSTRUMENTED DART SYSTEM.
AD-629 981 FLD. 4/2

• • •

AFCRL-69-872
A METHOD OF SOLVING THE INTEGRAL EQUATIONSFOR THE ERTICAL PROPAGATION OF TIME-HARMONICELECTROMAGNETIC PLANE WAVES IN ANISOTROPICVERTICALLY-HOMOGENEOUS MEDIA,
AD-629 609 FLD. 20/14

• • •

AFCRL-6870
THE DESIGN AND DEVELOPMENT OF A HIGHRESOLUTION ECHELLE VACUUM SPECTROGRAPHAND ITS APPLICATION TO THE MEASUREMENT OFTHE MOLECULAR CONSTANTS OF THE 1Σ(+) STATEOF NO(+).
AD-629 337 FLD. 20/6

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS AEROSPACE INSTRUMENTATION LAB

• • •

IP-79
A SYSTEM FOR THE DETERMINATION OF THEVERTICAL WIND PROFILE FROM AN AIRCRAFT.
(AFCRL-69-704)
AD-629 188 FLD. 4/2

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS DATA SCIENCES LAB

• • •

PSRP-149
MINIMAX DETECTION STATION PLACEMENT.
(AFCRL-69-728)
AD-629 135 FLD. 19/7

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS METEOROLOGY LAB
• • •
ERP-126
OZONE AND TEMPERATURE STRUCTURE IN AHURRICANE.
(AFCRL-69-629)
AD-629 123 FLD. 4/2

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS MICROWAVE PHYSICS LAB
• • •
PSRP-141
ON TRANSIENT WAVE PROPAGATION IN A PLASMA.
(AFCRL-69-702)
AD-629 133 FLD. 20/14
• • •
PSRP-157
ON MEASURING THE RADAR CROSS SECTIONS OFDUCKS AND CHICKENS.
(AFCRL-69-769)
AD-629 163 FLD. 17/9
• • •
PSRP-158
MICROWAVE MEASUREMENTS OF PARTIALLYCOHERENT FIELDS.
(AFCRL-69-784)
AD-629 128 FLD. 20/14
• • •
PSRP-159
THE CONTROL OF ELECTROMAGNETIC SCATTERINGBY IMPEDANCE LOADING.
(AFCRL-69-808)
AD-629 122 FLD. 20/14
• • •
SR-34
THE AFCRL 29-FT MILLIMETER-WAVE ANTENNA.
(AFCRL-69-726)
AD-629 170 FLD. 9/5
• • •
SR-36
A LOOK INTO THE FUTURE OF RADAR SCATTERINGRESEARCH AND DEVELOPMENT.
(AFCRL-69-809)
AD-629 164 FLD. 17/9

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SOLID STATE SCIENCES LAB
• • •
PSRP-135
CHARACTERISTIC FREQUENCIES FROM INFRAREDAND ELASTIC DATA.
(AFCRL-69-677)
AD-629 166 FLD. 20/12
• • •
PSRP-153
EFFECTS OF EXPERIMENTAL PARAMETERS ONTHERMOLUMINESCENCE OF A TYPE II-A DIAMOND.
(AFCRL-69-749)
AD-629 169 FLD. 20/12

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB
• • •
ERP-149
SIGNIFICANCE OF THE UNEQUILIBRATED ORDINARYCHONDRITES.
(AFCRL-69-744)
AD-629 165 FLD. 8/7
• • •
INSTRUMENTATION PAPERS-84
AN ATTEMPT TO REDUCE THE GAS LOAD IN ANULTRAHIGH-VACUUM CHAMBER.
(AFCRL-69-743)
AD-629 132 FLD. 14/2
• • •
PSRP-146
HYDROMAGNETIC IONIZING WAVES.
(AFCRL-69-706)
AD-629 171 FLD. 20/9
• • •
PSRP-160
SUBSTITUTED PERINAPHTHENYL ANION RADICALS.
(AFCRL-69-810)
AD-629 121 FLD. 7/3

•AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS UPPER ATMOSPHERE PHYSICS LAB
• • •
ERP-142
ROCKET SPECTRA OF THE CHROMOSPHERE.
(AFCRL-69-708)
AD-629 134 FLD. 3/2
• • •
ERP-146
SOLAR XUV SPECTRUM OF MARCH, 1969.
(AFCRL-69-745)
AD-629 131 FLD. 3/2
• • •
ERP-147
ABSOLUTE INTENSITY MEASUREMENTS IN THEEXTREME ULTRAVIOLET SPECTRUM OF SOLARRADIATION.
(AFCRL-69-746)
AD-629 124 FLD. 20/6
• • •
PSRP-144
ELECTRON CAPTURE FROM ATOMIC NITROGENAND OXYGEN BY PROTONS.
(AFCRL-69-698)
AD-629 138 FLD. 20/8

•AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO
• • •
AFFDL-TR-69-73
AN ANALYTICAL STUDY OF V/STOL HANDLINGQUALITIES IN HOVER AND TRANSITION.
AD-629 599 FLD. 1/2
• • •
AFFDL-TR-69-79
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
AD-629 889 FLD. 13/7
• • •
AFFDL-TR-69-121
A PROBE FOR THE MEASUREMENT OF HIGH SURFACETEMPERATURES,
AD-629 888 FLD. 14/2
• • •
AFFDL-TR-69-197
THE EVOLUTION OF USAF ENVIRONMENTAL TESTING.
AD-629 593 FLD. 14/2

•AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
• • •
GA/MECH/69-38
MINIMUM FUEL TRAJECTORIES FOR THRUSTLIMITED ROCKETS IN AN ADVERSE SQUARE GRAVITYFIELD.
AD-629 395 FLD. 22/2
• • •
GA/MECH/69-90
SOME PERIODIC TRAJECTORIES IN CISLUNAR SPACEVERY RESTRICTED FOUR BODY APPROXIMATION.
AD-629 373 FLD. 3/3
• • •
GA/MECH/69-91
AN INVESTIGATION OF THE EFFECT OF LAUNCHSITE LOCATION AND VARIATION OF LAUNCHPARAMETERS ON LUNAR-EARTH TRAJECTORIES.
AD-629 394 FLD. 22/3
• • •
GAW/MECH/69-24
AN ANALOG COMPUTER STUDY OF VAN DER POL'SEQUATION AND ITS RESPONSE TO WHITE GAUSSIANNOISE.
AD-629 372 FLD. 12/1
• • •
GAW/MECH/69-27
THE RESPONSE OF A BEAM TO AN IMPACT LOADING.
AD-629 991 FLD. 20/11
• • •
GSF/MECH/69-3
THE EFFECTS OF EXTREME ULTRAVIOLETRADIATION ON THE REFLECTANCE OF THERMALCONTROL SURFACE COATINGS.
AD-629 992 FLD. 22/2
• • •
GSF/MECH-69-43
THE RESPONSE OF SELECTED ROCK SPECIMENSTO VACUUM ULTRAVIOLET LIGHT.
AD-629 393 FLD. 8/7
• • •
MECH/GSF-69-35
AN INVESTIGATION OF THE EFFECTS OF GRAVITYON CRATER FORMATION IN A COHESIONLESSMEDIUM.
AD-629 391 FLD. 19/9

•AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO
• • •
AFML-69-420
INFRARED SPECTRA OF POLYATOMIC HIGHTEMPERATURE MOLECULES.
AD-629 049 FLD. 7/2
• • •
AFML-TR-69-417
NEW METHOD OF MEASURING TRANSITIONPROBABILITIES.
AD-629 599 FLD. 7/4
• • •
AFML-TR-69-419
INVESTIGATION OF THE PROPERTIES OF HOTPLASMA GASES AND MEASUREMENT OF GASTEMPERATURES NEAR SOLID SURFACES.
AD-629 043 FLD. 20/9
• • •
ML-TDR-64-135
TRANSITION-METAL CARBON CHEMISTRY.
AD-629 988 FLD. 7/2
• • •
ML-TR-69-289
AN INFRARED STUDY OF POLYFLUORINATEDAROMATICS IN THE LOW-FREQUENCY REGION.
AD-629 129 FLD. 7/3

•AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C
• • •
AFOSR-69-1798
THERMODYNAMICS OF THE LIQUID-LIQUIDCRITICAL MIXING REGION.
AD-629 455 FLD. 20/13
• • •
AFOSR-69-1920
USE OF META-LANGUAGE IN INFORMATIONRETRIEVAL SYSTEMS,
AD-629 577 FLD. 5/2
• • •
AFOSR-69-1957
ROLE ASSIGNMENT AND ATTITUDINAL COMMITMENT AS FACTORS IN NEGOTIATION.
AD-629 387 FLD. 5/10
• • •
AFOSR-69-1958
SOCIAL MOTIVES AND DECISION-MAKINGBEHAVIOR IN INTERPERSONAL SITUATIONS.
AD-629 487 FLD. 5/10
• • •
AFOSR-69-1987
ELASTIC-PLASTIC ANALYSIS OF THE COLLAPSEOF UNIFORMLY COMPRESSED CIRCULAR CYLINDRICALSHELLS,
AD-629 276 FLD. 20/11
• • •
AFOSR-69-1988
THE SNAP-THROUGH AND POSTBUCKLINGEQUILIBRIUM BEHAVIOR OF CIRCULAR CYLINDRICALSHELLS UNDER AXIAL LOAD.
AD-629 279 FLD. 20/11
• • •
AFOSR-69-1671
ANALYSIS OF RELAXATION PROCESSES IN AMULTILEVEL SYSTEM. A MANY-SHOT EXPANSIONTECHNIQUE.
AD-629 602 FLD. 7/4

• • •

AFOSR-69-1684
INTERACTION OF THREE HYDROGEN ATOMS.
AD-629 900 FLD. 20/8

• • •

AFOSR-69-1687
MICROWAVE SPECTROSCOPIC STUDIES OFMOLECULES.
AD-629 997 FLD. 7/4

• • •

AFOSR-69-1713
A STUDY OF A FAMILY OF COMPLEX SYSTEMSIAN APPROACH TO THE INVESTIGATION OF ORGANISMSBEHAVIOR.
AD-629 869 FLD. 6/4

• • •

AFOSR-69-1729
DEOXYGENATION REACTIONS OF AMINE OXIDES ANDSULFOXIDES.
AD-629 919 FLD. 7/3

• • •

AFOSR-69-1730
INTERNATIONAL YEARS OF THE QUIET SUNVOLUME I (ANOS INTERNACIONALES DEL SOL CALMO).
AD-629 036 FLD. 4/1

• • •

AFOSR-69-1731
DETERMINATION OF THE STRUCTURE OF O3F2.
AD-629 077 FLD. 7/2

• • •

AFOSR-69-1733
RESPONSE OF A BURNING SOLID PROPELLANT TOPRESSURE WAVES OF FINITE AMPLITUDE.
AD-629 999 FLD. 21/9

• • •

AFOSR-69-1735
A FORTRAN PROGRAMME FOR THE ANALYSIS OFHYPERFRAGMENTS AND FOR OTHER EMULSIONSTUDIES,
AD-629 019 FLD. 18/8

• • •

AFOSR-69-1736
MONOTONE CONGRUENCE ALGORITHMS,
AD-629 096 FLD. 9/2

• • •

AFOSR-69-1739
A THEOREM ON THE ZEROS OF CAUSALTRANSFORMS,
AD-629 957 FLD. 12/1

• • •

AFOSR-69-1756
THE RICCATI EQUATION AND REGGE POLES,
AD-629 359 FLD. 12/1

• • •

AFOSR-69-1761
NUCLEAR MAGNETISM,
AD-629 548 FLD. 20/8

• • •

AFOSR-69-1762
POINT DEFECTS IN MAGNESIUM OXIDE,
AD-629 950 FLD. 20/12

• • •

AFOSR-69-1776
QUANTUM MECHANICS OF A MANY-BOSON SYSTEMAND THE REPRESENTATION OF CANONICALVARIABLES,
AD-629 971 FLD. 20/10

• • •

AFOSR-69-1782
THE PROBLEM OF CAUSALITY IN S-MATRIXTHEORY,
AD-629 397 FLD. 20/10

• • •

AFOSR-69-1786
HEAT CAPACITY AND THERMODYNAMICPROPERTIES OF BERYLLIUM ALUMINATE(CHRYSOBERYL), BEO-A1203, FROM 16 TO 380K,
AD-629 096 FLD. 20/13

• • •

AFOSR-69-1787
SPONTANEOUS SYMMETRY BREAKDOWN AND THEMU-E-GAMMA INTERACTION,
AD-629 963 FLD. 20/8

• • •

AFOSR-69-1791
HETEROGENEOUS COMBUSTIONS AND FLAMESSTRUCTURES.
AD-629 019 FLD. 21/2

• • •

AFOSR-69-1792
FACTORS INVOLVED IN THE STABILITY OFCYCLOPROPANES.
AD-629 080 FLD. 7/3

• • •

AFOSR-69-1802
PLASMA JET CHEMISTRY.
AD-629 991 FLD. 20/9

• • •

AFOSR-69-1809
INTENTIONAL COMBUSTION OSCILLATIONS INPROPULSION SYSTEMS.
AD-629 999 FLD. 21/8

• • •

AFOSR-69-1811
ENERGY ESTIMATION FOR HIGH-ENERGY NUCLEARINTERACTIONS,
AD-629 969 FLD. 20/8

• • •

AFOSR-69-1813
A NOTE ON FIELD THEORIES WITHOUT MASSRENORMALIZATION,
AD-629 959 FLD. 20/8

• • •

AFOSR-69-1814
MASS FORMULA IN THE COVARIANT SPIN-UNITARYSPIN SCHEME,
AD-629 961 FLD. 20/8

• • •

AFOSR-69-1815
COMMENTS ON RELATIVISTIC SUPERMULTIPLETTHEORIES,
AD-629 973 FLD. 20/8

• • •

AFOSR-69-1817
PROOF THAT SCATTERING IMPLIES PRODUCTION INQUANTUM FIELD THEORY,
AD-629 969 FLD. 20/8

• • •

AFOSR-69-1818
SELECTION RULES FOR PARAFIELDS AND THEABSENCE OF PARA PARTICLES IN NATURE.
AD-629 972 FLD. 20/10

• • •

AFOSR-69-1820
NEUTRON MONITOR MASS ABSORPTION COEFFICIENTS AT CHICAGO AND CLIMAX DURING SOLARCYCLE 19 (1954-1963).
AD-629 600 FLD. 4/1

• • •

AFOSR-69-1823
PHOTONS AND GRAVITONS IN PERTURBATIONTHEORY: DERIVATION OF MAXWELL'S ANDEINSTEIN'S EQUATIONS.
AD-629 962 FLD. 20/10

• • •

AFOSR-69-1843
OPTICAL PROPERTIES OF METALS AND ALLOYS.
AD-629 371 FLD. 11/6

• • •

AFOSR-69-1883
A SEQUENTIAL LOGIC FOR INFORMATION STRUCTURING.
AD-629 488 FLD. 12/1

• • •

AFOSR-69-1891
1969 CONGRESS, INTERNATIONAL FEDERATION FORDOCUMENTATION (FID), 10-15 OCTOBER 1969,WASHINGTON, D. C.: ABSTRACTS.
AD-629 498 FLD. 5/2

• • •

AFOSR-69-1903
MECHANISMS OF TRANSGRANULAR STRESSCORROSION CRACKING OF SOLID SOLUTION ALLOYS,
AD-629 994 FLD. 11/6

• • •

AFOSR-69-1904
NUCLEAR SPIN RELAXATION IN P-TYPE INSB ATLIQUID-HELIUM TEMPERATURES,
AD-629 978 FLD. 20/12

• • •

AFOSR-69-1907
THEORETICAL CONSIDERATIONS OF PANEL FLUTTERAT HIGH SUPERSONIC MACH NUMBERS,
AD-629 999 FLD. 20/11

• • •

AFOSR-69-2174
INTERACTION PROCESS AND TASK OUTCOME INEXPERIMENTALLY-CREATED NEGOTIATION GROUPS.
AD-629 988 FLD. 5/10

• • •

AFOSR-69-2183
A MODEL REQUIRING LIE GROUP SYMMETRIES,
AD-629 398 FLD. 20/8

• • •

AFOSR-69-2187
ON THE TURBULENCE DEVELOPMENT IN THEBOUNDARY LAYER WITH PRESSURE GRADIENT.
AD-629 361 FLD. 20/4

• • •

AFOSR-69-2190
A STUDY OF SOME APPROXIMATION SCHEMES INQUANTUM MECHANICS,
AD-629 994 FLD. 20/10

• • •

AFOSR-69-2191
NUMERICAL SOLUTION OF FIXED-SOURCE FIELDTHEORIES,
AD-629 997 FLD. 20/10

• • •

AFOSR-69-2192
SOLUTION OF A BETHE-SALPETER EQUAON,
AD-629 996 FLD. 20/8

• • •

AFOSR-69-2194
ANODE STRUCTURES FOR COLD-CATHODE HIGHPOWER MAGNETRONS.
AD-629 983 FLD. 9/1

• • •

AFOSR-69-2198
IONIC COPOLYMERIZATION OF STYRENE ANDP-METHYL-STYRENE.
AD-629 941 FLD. 11/9

• • •

AFOSR-69-2199
THERMODYNAMICS OF A SOLAR COMPOSITIONGASEOUS MIXTURE,
AD-629 939 FLD. 3/2

• • •

AFOSR-69-2200
VISCOSITY MEASUREMENTS OF IONIC MELTS ATTEMPERATURES TO 1100C.
AD-629 936 FLD. 7/4

• • •

AFOSR-69-2202
CARBALKOXYNITRENES. THE PHOTOLYTIC DECOMPOSITION OF GASEOUS ALKYL AZIDOFORMATES,
AD-629 937 FLD. 8/1

• • •

AFOSR-69-2203
SEEKING INFORMATION TO REDUCE THE RISK OFDECISIONS,
AD-629 942 FLD. 5/10

• • •

AFOSR-69-2204
INTERPRETATION OF THE SOFT X-RAY EMISSIONSPECTRUM OF LITHIUM METAL,
AD-629 996 FLD. 20/2

• • •

AFOSR-69-2205
FORMATION OF DETONATION WAVES INCOMBUSTIBLE GASEOUS MIXTURES,
AD-629 989 FLD. 19/4

• • •

AFOSR-69-2208
THE METHOD OF WEIGHTED RESIDUALS AND ITSRELATION TO CERTAIN VARIATIONAL PRINCIPLESFOR THE ANALYSIS OF TRANSPORT PROCESSES,
AD-629 991 FLD. 9/1

• • •

AFOSR-69-2223
SUMMARY REPORT.
AD-629 034 FLD. 6/3

• • •

AFOSR-65-2252
L'ACTIVITE ELECTRIQUE PHASIQUE DU CORTEX ETDU THALAMUS AU COURS DU SOMMEIL DESYNCHRONISE CHEZ LE CHAT (PHASIC ELECTRICAL ACTIVITY OF THECORTEX AND OF THE THALAMUS DURING DESYNCHRONIZED SLEEPOF THE CAT),
AD-625 342 FLD. 6/16

• • •

AFOSR-65-2255
HIGH-RESOLUTION OBSERVATIONS OF THE RADIOSUN AT 9.1 CENTIMETERS ON JULY 20, 1963,
AD-625 366 FLD. 3/2

• • •

AFOSR-65-2260
FORCED VAPORIZATION OF WATER,
AD-625 363 FLD. 20/13

• • •

AFOSR-65-2263
COMPUTER PROCESSING AND CULTURAL DATA:PROBLEMS OF METHOD,
AD-625 369 FLD. 9/2

• • •

AFOSR-65-2266
TRANSPIRATION COOLING WITH CHEMICALREACTIONS,
AD-625 367 FLD. 20/13

• • •

AFOSR-65-2291
ION RADICALS. VI. PHENOXATHIIN ANDPHENOXATHIIN 5-OXIDE IN SULFURIC ACID,
AD-625 592 FLD. 7/3

• • •

AFOSR-65-2292
ION RADICALS. V. PHENOTHIAZINE, PHENOTHIAZINE5-OXIDE, AND PHENOTHIAZONE-3 IN ACID SOLUTIONS,
AD-625 593 FLD. 7/3

• • •

AFOSR-65-2293
ION RADICALS. VII. THE REACTIONS OFTHIANTHRENE OXIDE IN HYDROCHLORIC ACID,
AD-625 590 FLD. 7/3

• • •

AFOSR-65-2294
THERMODILATOMETRIC ANALYSIS: SOMECHEMICAL APPLICATIONS,
AD-625 589 FLD. 7/4

• • •

AFOSR-65-2444
A UNIFIED THEORY OF SYNTHESIS WITH UNSYMMETRIC FOUR-ELEMENT LOSSLESS LATTICES,
AD-625 576 FLD. 9/5

• • •

AFOSR-65-2649
PHOTOSYNTHETIC MECHANISMS UNDER SUB-OPTIMAL CONDITIONS.
AD-625 495 FLD. 6/1

•AIR FORCE WEAPONS LAB KIRTLAND AFB N MEX

• • •

WL-TR-65-140
FRACTURE OF GYPSUM PLASTERS AND CEMENTMORTARS BY DYNAMIC LOADING.
AD-625 458 FLD. 11/2

• • •

WL-TR-65-147
EQUATION OF STATE OF SOLIDS: ALUMINUM ANDTEFLON.
AD-625 579 FLD. 20/13

•ALBERTA UNIV CALGARY DEPT OF PHYSICS

• • •

AN ELECTROMECHANICAL VERSION OF THE IGYRIOMETER,
AD-625 083 FLD. 14/2

• • •

COSMIC NOISE AND MAGNETIC MEASUREMENTSAT CALGARY DURING THE SOLAR ECLIPSE OF JULY20, 1963.
AD-625 108 FLD. 3/2

•ALBERTA UNIV EDMONTON

• • •

SEMIQUANTITATIVE ASPECT OF SHORTBRANCH DETECTION BY USING POLYELECTROLYTEEXPANSIVE EFFECTS,
AD-625 524 FLD. 7/4

•ALCOA RESEARCH LABS ALUMINUM CO OF AMERICA NEW KENSINGTON PA

• • •

FRACTURE TOUGHNESS, FATIGUE-CRACKPROPAGATION AND CORROSION CHARACTERISTICS OFALUMINUM ALLOY PLATES FOR WING SKINS.
AD-625 454 FLD. 11/6

•AMERICAN CHIROPRACTIC ASSOCIATION WASHINGTON D C DEPT OF RESEARCH AND STATISTICS

• • •

UNITERMS AND THE LEARNING CURVE,
AD-625 027 FLD. 9/2

•AMERICAN MUSEUM OF NATURAL HISTORY NEW YORK DEPT OF ANIMAL BEHAVIOR

• • •

AUDITORY CAPACITIES IN FISHES: THRESHOLDVARIABILITY IN THE BLUE-STRIPED GRUNT,HAEMULON SCIURUS,
AD-625 299 FLD. 6/3

•AMERICAN OIL CO WHITING IND RESEARCH AND DEVELOPMENT DEPT

• • •

M65-265
THE FO RADICAL AND PRESSURE REACTIONS OFN2F2,
AD-624 928 FLD. 7/2

•ANAGRAM CORP SPRINGFIELD VA

• • •

AF(ANAGRAM)-1999
PROGRAMMING SYSTEM CL-I EXTENDED (CLIX),
AD-625 383 FLD. 9/2

•ARIZONA UNIV TUCSON ENGINEERING EXPERIMENT STATION

• • •

THE EFFECT OF SIMULATED FISSION PRODUCTS INTHE INTER-ELECTRODE SPACING OF A THERMIONICDIODE.
AD-625 586 FLD. 18/10

•ARIZONA UNIV TUCSON LUNAR AND PLANETARY LAB

• • •

INVESTIGATION OF O AND B SPECTRA OF STARS.
AD-625 032 FLD. 3/2

•ARMY ARMOR BOARD FORT KNOX KY

• • •

TRANSLATION-1390
NITROGENOUS SUBSTANCE CHANGES IN THENUTRITIVE BROTHS PREPARED FROM THE DRYKPD PREPARATION FOLLOWING CULTURING OF CL.BOTULINUM OF THE A, B, C AND E TYPES,
(TT-66-60106)
AD-625 617 FLD. 6/13

•ARMY BIOLOGICAL LABS FREDERICK MD

• • •

FREEING THE AIR OF MICROFLORA UNDER THEACTION OF ARTIFICIAL AEROIONIZATION,
AD-625 655 FLD. 6/13

• • •

1151
SEMINAR ON NEW ENSILAGE FORAGE PLANTS,
(TT-66-60121)
AD-625 691 FLD. 6/3

• • •

1369
ANTIGENIC STRUCTURE OF THE BAC. ANTHRACISVACCINAL STRAIN,
(TT-66-60124)
AD-625 645 FLD. 6/13

• • •

1375
THE REACTION OF ORNITHODOROS PAPILLIPESBIR. TO SOME PHYSICAL FACTORS OF THE ENVIRONMENT,
(TT-66-60120)
AD-625 640 FLD. 6/3

• • •

1378
EXPERIMENTAL ANALYSIS OF THE IMPORTANCE OFTHE DIFFERENT PHASES IN THE METAMORPHOSISOF ORNITHODOROS PAPILLIPES IN THE TRANSMISSIONOF THE SPIROCHAETES OF TICK-BORNE RELAPSINGFEVER,
(TT-66-60119)
AD-625 633 FLD. 6/3

• • •

1384
TEMPERATURE CHANGES IN THE BODY OFORNITHODOROS PAPILLIPES DURING BLOODSUCKING,
(TT-66-60123)
AD-625 644 FLD. 6/3

• • •

1388
MACROPHAGE CULTURES PREPARED IN VITROAND A MORPHOLOGICAL STUDY OF THEIRCELLULAR ELEMENTS,
(TT-66-60122)
AD-625 642 FLD. 6/13

• • •

MISCELLANEOUS PUBLICATION-12
RECOVERY OF SPECIFIC MICROORGANISMSFROM URINE AND FECES OF INFECTED ANIMALS,
AD-625 296 FLD. 6/13

• • •

TRANSLATION 1038
QUESTIONS IN THE EPIDEMIOLOGY AND PROPHYLAXISOF TULAREMIA,
(TT-66-60118)
AD-625 632 FLD. 6/13

• • •

TRANSLATION-1044
THE STRUCTURE OF THE FIELDS OF WINDVELOCITY AND TEMPERATURE IN THE SURFACELAYER OF THE ATMOSPHERE,
(TT-66-60108)
AD-625 621 FLD. 9/2

• • •

TRANSLATION-1365
NATURAL TULAREMIA FOCI ON THE TERRITORYOF THE UKRAINIAN SSR,
(TT-66-60125)
AD-625 647 FLD. 6/13

• • •

TRANSLATION-1366
A STUDY OF IMMUNOGENESIS FOLLOWINGVACCINATION WITH THE LIVE ASSOCIATED VACCINE.REPORT I. A STUDY OF IMMUNOGENESIS IN GUINEAPIGS VACCINATED WITH BRUCELLOSIS AND ANTHRAXVACCINE,
(TT-66-60126)
AD-625 651 FLD. 6/13

• • •

TRANSLATION-1367
PROPERTIES OF CULTURES OF ANTHRAXBACILLI GROWN AT VARIOUS TEMPERATURES,
(TT-66-60113)
AD-625 629 FLD. 6/13

• • •

TRANSLATION-1368
BIOLOGICAL PROPERTIES OF THE NIIEGTULAREMIA VACCINE STRAINS,
(TT-66-60109)
AD-625 623 FLD. 6/13

• • •

TRANSLATION-1370
STRIGA LUTEA,
(TT-66-60110)
AD-625 624 FLD. 6/3

• • •

TRANSLATION-1371
OMSK HEMORRHAGIC FEVER INCIDENCE IN MANAND MUSKRATS IN WINTER,
(TT-66-60129)
AD-625 657 FLD. 6/13



789-657 O - 66 - 13

• • •

TRANSLATION-1372
THE POSSIBILITY OF USING B PRODIGIOSUMAS AN EXPERIMENTAL BACTERIAL AEROSOL MODEL, (TT-66-60109)
AD-629 616 FLD. 6/13

• • •

TRANSLATION-1373
IMMUNOLOGICAL ACTIVITY OF LYMPHOID ORGANSDURING AEROSOL AND SUBCUTANIOUS TYPHOIDIMMUNIZATION, (TT-60117)
AD-629 631 FLD. 6/13

• • •

TRANSLATION-1374
GAS-LIQUID CHROMATOGRAPHY OF METHYLETHERS OF HIGHER FATTY ACIDS OF SENDAIVIRUS LIPID COMPONENT, (TT-66-60112)
AD-629 626 FLD. 6/1

• • •

TRANSLATION-1376
CONTRIBUTION TO THE BIOLOGY OF THE TICKORNITHODOROS PAPILLIPES, (TT-66-60111)
AD-629 629 FLD. 6/3

• • •

TRANSLATION-1377
THE EFFECT OF REDUCED ATMOSPHERICPRESSURE AND SEVERAL GASES ON THE TICKSORNITHODOROS PAPILLIPES BIR., (TT-66-60127)
AD-629 653 FLD. 6/3

• • •

TRANSLATION-1379
THE FUNCTIONAL MORPHOLOGY OF ORNITHODOROSTICKS, (TT-66-60113)
AD-629 627 FLD. 6/3

• • •

TRANSLATION-1380
APPLICATION OF ANTIBOTULINUM ALIZARINSUSPENSION AGGLUTININS FOR THE RAPID DETECTIONOF THE BOTULISM CAUSATIVE AGENT, (TT-66-60107)
AD-629 620 FLD. 6/13

• • •

TRANSLATION-1381
STIMULATION OF TYPHOID AGGLUTININS UNDERTHE INFLUENCE OF THE EV PLAGUE VACCINE, (TT-66-60098)
AD-629 608 FLD. 6/13

• • •

TRANSLATION-1382
STUDY OF THE ABILITY OF ENTERIC BACTERIATO INFECT THE AIR OF HOSPITAL WARDS, (TT-66-60114)
AD-629 628 FLD. 6/13

• • •

TRANSLATION-1387
ZOONOSES OF LABORATORY ANIMALS AND THEIRDANGER TO MAN, (TT-66-60099)
AD-629 610 FLD. 6/3

• • •

TRANSLATION-1389
DYNAMICS OF A BACTERIAL AEROSOL IN THE DUSTAND DROP PHASE, (TT-66-60104)
AD-629 619 FLD. 19/2

• • •

TRANSLATION-1402
THE COMPATIBILITY OF ANTHRAX STI VACCINEIN ASSOCIATION WITH PLAGUE TULAREMIA ANDBRUCELLOSIS VACCINES, (TT-66-60100)
AD-629 611 FLD. 6/13

• • •

TRANSLATION NO. 1026
A NEW VARIETY OF PLAGUE MICROBE, (TT-60-60116)
AD-629 630 FLD. 6/13

*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH

• • •

FUNDAMENTAL THEOREM IN QUANTUM OPTICS,
AD-629 997 FLD. 20/6

*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

• • •

MICROWAVE GENERATION FROM AVALANCHINGVARACTOR DIODES,
AD-629 996 FLD. 9/5

• • •

ECOM-2937
EVALUATION OF METEOROLOGICAL ROCKETWIND SENSORS.
AD-629 388 FLD. 4/2

• • •

ECOM-2639
IMPROVED THIN-FILM CAPACITOR CHARACTERISTICSBY REANODIZATION.
AD-629 931 FLD. 9/1

• • •

ECOM-2638
PRESSURE BURSTS IN BAKEABLE ULTRA-HIGHVACUUM VALVES DURING OPENING AND CLOSING.
AD-629 120 FLD. 13/11

• • •

ECOM-2639
FURTHER STUDIES ON HYDROGEN AND DEUTERIUMCLEANUP.
AD-629 389 FLD. 9/1

*ARMY ELECTRONICS LABS FORT MONMOUTH N J

• • •

APPLICATION OF INFRARED RADIOMETERS TOMETEOROLOGY,
AD-629 948 FLD. 4/2

• • •

FORTSCHRITTE AUF DEM GEBIET DERNEBENWELLENBESEITIGUNG IN DIECKNSCHERUNGSSCHWINGENDEN QUARZPLATTEN INFREQUENZBEREICH VON 5 BIS 100 MHZ (PROGRESS INTHE AREA OF SECONDARY WAVE ELIMINATION IN THICKNESSSHEAR VIBRATION QUARTZ PLATE IN THE FREQUENCY RANGEBETWEEN 5 TO 100 MHZ),
AD-629 949 FLD. 9/5

• • •

MODIFIED ISOBAR APPROXIMATION FOR PI-RHOSCATTERING,
AD-629 950 FLD. 20/8

• • •

ON OPTIMIZING EFFICIENCY AND BANDWITH OFINDUCTIVELY LOADED ANTENNAS,
AD-629 951 FLD. 9/5

• • •

SCATTERING PROPERTIES OF CONCENTRIC SOOTWATER SPHERES FOR VISIBLE AND INFRAREDLIGHT,
AD-629 952 FLD. 20/6

*ARMY ENGINEER GEODESY INTELLIGENCE AND MAPPING RESEARCH AND DEVELOPMENT AGENCY FORT BELVOIR VA

• • •

GIMRADA-RN-13
RESULTS OF SPACE TRIANGULATION ADJUSTMENTSFROM SATELLITE DATA.
AD-629 298 FLD. 8/9

• • •

GIMRADA-RN-19
REDUCTION PROCEDURES FOR ABSOLUTEDIRECTION AND GEODETIC AZIMUTHS FROM OPTICALOBSERVATIONS OF SATELLITES.
AD-629 356 FLD. 8/9

*ARMY ENGINEER RESEARCH AND DEVELOPMENT LABS FORT BELVOIR VA

• • •

AERDL-1833
FULMINATES: A LITERATURE SURVEY.
AD-629 397 FLD. 7/3

• • •

AERDL-RR-1832
BLAST EFFECTS ON U. S. ARMY WATER-STORAGECONTAINERS.
AD-629 396 FLD. 19/4

*ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

• • •

MISCELLANEOUS PAPER-4-300
AERIAL PENETROMETER DEMONSTRATION ATFORT RUCKER, ALABAMA,
AD-629 601 FLD. 14/2

• • •

TR-3-703
A STUDY OF THE EFFECTS OF WET SURFACE SOILCONDITIONS ON THE PERFORMANCE OF A SINGLEPNEUMATIC-TIRED WHEEL.
AD-629 390 FLD. 13/6

*ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS

• • •

AMRA-CR64-04/3
INVESTIGATION OF SOLIDIFICATION OF HIGHSTRENGTH STEEL CASTINGS.
AD-629 987 FLD. 11/6

*ARMY MEDICAL RESEARCH LAB FORT KNOX KY

• • •

AMRL-TR-65-37-VOL-2
COMMUNITY REACTIONS TO SONIC BOOMS IN THEOKLAHOMA CITY AREA. VOLUME II. DATA ONCOMMUNITY REACTIONS AND INTERPRETATIONS.
AD-629 332 FLD. 1/3

• • •

AMRL-TR-65-153
DESIGN OF A TEST MODEL FOR A SOLID ELECTROLYTECARBON DIOXIDE REDUCTION SYSTEM.
AD-629 982 FLD. 6/11

• • •

AMRL-TR-65-156
STUDY AND DEVELOPMENT OF MATERIALS ANDTECHNIQUES FOR PASSIVE THERMAL CONTROL OFFLEXIBLE EXTRAVEHICULAR SPACE GARMENTS.
AD-629 886 FLD. 6/11

• • •

AMRL-TR-65-168
CONCEPTS AND PRACTICES IN THE ASSESSMENTOF HUMAN PERFORMANCE IN AIR FORCE SYSTEMS.
AD-629 041 FLD. 5/10

*ARMY MISSILE COMMAND REDSTONE ARSENAL ALA

• • •

TAMPER: TABLES FOR APPROXIMATION OFMID-POINTS FOR EXPONENTIAL REGRESSION.
AD-629 339 FLD. 12/1

*ARMY NATICK LABS MASS

• • •

STUDIES OF BEEF IRRADIATION FLAVOR USING ACONCURRENT RADIATION-DISTILLATION TECHNIQUE.
AD-629 999 FLD. 6/8

• • •

ME-9
THE BIAXIAL STRESS-STRAIN BEHAVIOR OF FABRICS.
AD-629 295 FLD. 11/5

*ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C

• • •

TRN-161
FACTORING TO FIT OFF DIAGONALS.
AD-629 222 FLD. 9/9

• • •

TRN-162
TIMELINESS AND ACCURACY IN A SEQUENTIALDECISION MAKING TASK.
AD-629 223 FLD. 5/9

• • •

TRN-163

OPTIMAL ALLOCATION OF ENLISTED MEN; FULLREGRESSION EQUATIONS VS. APTITUDE AREA SCORES.
AD-629 224 FLD. 5/9

•ARMY RESEARCH AND DEVELOPMENT GROUP (FAR EAST) SAN FRANCISCO CALIF 96343

• • •

ARDG(FE)-J-196
BIOLOGICAL SIGNIFICANCE OF A PROTEASEINHIBITOR NEWLY ISOLATED FROM ANIMAL TISSUESIN INFLAMMATION.
AD-629 889 FLD. 6/1

•ARMY RESEARCH OFFICE DURHAM N C

• • •

AROD-3138:18
TERNARY INTERSTITIAL COMPOUNDS OF BORONAND NITROGEN WITH TRANSITION AND POSTTRANSITION METALS.
AD-629 028 FLD. 11/6

• • •

AROD-3193:1
OXIDATIVE STUDIES OF POLYPHENOLS.
AD-629 879 FLD. 7/3

• • •

AROD-3298:22
A NOTE ON THE RELIABILITY OF COMMUNICATIONNETWORKS.
AD-629 652 FLD. 14/9

• • •

AROD-3342:9
THE SYNTHESIS AND REACTIONS OF BISDIPHENYLPHOSPHINIC PEROXIDE,
AD-629 650 FLD. 7/3

• • •

AROD-3342:6
THE SYNTHESIS AND PROPERTIES OF TINHYDROPEROXIDES,
AD-629 649 FLD. 7/3

• • •

AROD-3342:8
THE DECOMPOSITION OF SILYL HYDROPEROXIDES,
AD-629 648 FLD. 7/3

• • •

AROD-3532:1
PATHS, TREES, AND FLOWERS,
AD-629 903 FLD. 12/2

• • •

AROD-3532:3
ON THE SURFACE DUALITY OF LINEAR GRAPHS,
AD-629 904 FLD. 12/2

• • •

AROD-3532:5
MINIMUM PARTITION OF A MATROID INTOINDEPENDENT SUBSETS,
AD-629 905 FLD. 12/2

• • •

AROD-3532:6
LEHMAN'S SWITCHING GAME AND A THEOREM OFTUTTE AND NASH-WILLIAMS,
AD-629 906 FLD. 12/2

• • •

AROD-3532:9
MAXIMUM MATCHING AND A POLYHEDRON WITHO,1-VERTICES,
AD-629 907 FLD. 12/2

• • •

AROD-3581:9
TETRASODIO BIS-BETA-DIKETONES.DICONDENSATIONS WITH ELECTROPHILICCOMPOUNDS,
AD-629 635 FLD. 7/3

• • •

AROD-3581:10
ALKYLATIONS OF PHENYLACETIC, ALPHAALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERSBY MEANS OF SODAMIDE AND SODIUM HYDRIDE,
AD-629 634 FLD. 7/3

• • •

AROD-3616:7
INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARYARSINE OXIDES,
AD-629 646 FLD. 7/4

• • •

AROD-3616:8
CRYSTAL STRUCTURE OF TETRAMERIC COBALT(II)ACETYLACETONATE,
AD-629 643 FLD. 7/4

• • •

AROD-3616:9
THE CRYSTAL AND MOLECULAR STRUCTURE OFPENTAKIS(METHYLISONITRILE)COBALT(I) PERCHLORATE,
AD-629 629 FLD. 7/4

• • •

AROD-3631:1
THE PHOTOCHEMICAL SYNTHESIS OF POLYAZACYCLOBUTANE SYSTEMS.
AD-629 218 FLD. 7/3

• • •

AROD-3631:2
THE PHOTOLYTIC DECOMPOSITION OF SOMESULFONES BY AN INTERNALLY SENSITIZED PATH,
AD-629 638 FLD. 7/3

• • •

AROD-3631:3
THE SYNTHESIS OF A PHENANTHRIDENE FROMAN AROMATIC SCHIFF BASE BY A PHOTOOXIDATIVERING CLOSURE.
AD-629 637 FLD. 7/3

• • •

AROD-3631:4
2,3-NAPHTHOQUINONOID HETEROCYCLES. II. AHIGHLY STABILIZED THIADIAZOLE ANALOG OFANTHRACENE.
AD-629 636 FLD. 7/3

• • •

AROD-3772:9
DISCRETE REPRESENTATIONS OF PARTIALDIFFERENTIAL OPERATORS.
AD-629 654 FLD. 12/1

• • •

AROD-4016:5
EFFECT OF A CYLINDRICAL BOUNDARY ON THEADDED MASS OF TWO CYLINDERS IN LIQUID HELIUM,
AD-629 656 FLD. 20/4

• • •

AROD-4047:1
DETERMINATION OF THE DECOMPOSITION KINETICSOF HYDRAZINE USING A SINGLE-PULSE SHOCK TUBE,
AD-629 175 FLD. 7/4

• • •

AROD-4222:5
X-RAY DIFFRACTION STUDIES OF THE MELTINGOF LINEAR POLYETHYLENE,
AD-629 176 FLD. 7/3

• • •

AROD-4222:6
A CALORIMETRIC STUDY OF THE FUSION OFMOLECULAR WEIGHT FRACTIONS OF LINEARPOLYETHYLENE,
AD-629 177 FLD. 7/3

• • •

AROD-4625 1
A POLYSACCHARIDE GRAFT COPOLYMER PREPAREDBY ANIONIC COUPLING,
AD-629 174 FLD. 11/9

•ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV

• • •

TR-65-1904
SYNTHESIS OF AMINOQUINONE POLYMERS.
AD-629 891 FLD. 11/10

• • •

TR-65-2812
RHEOLOGICAL PROPERTIES OF GREASES OVERWIDE TEMPERATURE RANGES.
AD-629 136 FLD. 11/8

• • •

TR-65-2959
DETERMINATION OF THE ALUMINA CONTENT OFALUMINUM ALLOYS.
AD-629 297 FLD. 11/6

•ATLANTIC REGIONAL LAB HALIFAX (NOVA SCOTIA)

• • •

THE STRUCTURE OF BOSTRYCOIDIN, A BETA-AZAANTHRAQUINONE FROM FUSARIUM SOLANI D2PURPLE,
AD-629 983 FLD. 7/3

• • •

AN APPROACH TO THE PROBLEM OF IONICDISTRIBUTION IN LIQUID SILICATES,
(NRC-8961)
AD-629 962 FLD. 7/4

•AUBURN UNIV ALA

• • •

A STUDY OF THE DECOMPOSITION MECHANISMOF AMMONIUM PERCHLORATE.
AD-629 191 FLD. 7/2

•BATTELLE MEMORIAL INST COLUMBUS OHIO

• • •

DEVELOPMENT OF EQUIPMENT FOR AUTOMATICNARROW-GAP WELDING FOR SHIPYARD USE.
AD-629 919 FLD. 13/9

• • •

G-6918
AN INFRARED STUDY OF POLYFLUORINATEDAROMATICS IN THE LOW-FREQUENCY REGION.
(ML-TR-65-289)
AD-629 129 FLD. 7/3

•BAUSCH AND LOMB INC ROCHESTER N Y

• • •

B/L-8926-IR-1
APPLICATION AND VERIFICATION OF MATHEMATICALMODEL OF PHOTOGRAPHIC RECONNAISSANCE.
AD-629 319 FLD. 15/7

•BIRMINGHAM UNIV (ENGLAND) DEPT OF CHEMISTRY

• • •

SCIENTIFIC-3
MICROWAVE SPECTROSCOPIC STUDIES OFMOLECULES.
(AFOSR-65-1687)
AD-629 997 FLD. 7/4

•BOSTON UNIV MASS DEPT OF PHYSICS

• • •

A THEOREM ON THE ZEROS OF CAUSALTRANSFORMS,
(AFOSR-65-1794)
AD-629 557 FLD. 12/1

• • •

A NOTE ON FIELD THEORIES WITHOUT MASSRENORMALIZATION,
(AFOSR-65-1813)
AD-629 559 FLD. 20/8

• • •

MASS FORMULA IN THE COVARIANT SPIN-UNITARYSPIN SCHEME,
(AFOSR-65-1814)
AD-629 561 FLD. 20/8

•BRANDEIS UNIV WALTHAM MASS DEPT OF PHYSICS

• • •

SPONTANEOUS SYMMETRY BREAKDOWN AND THEMU-E-GAMMA INTERACTION,
(AFOSR-65-1787)
AD-629 563 FLD. 20/8

•BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING

• • •

TR-99
AN EXPERIMENTAL INVESTIGATION OF ELASTICPLASTIC PULSE PROPAGATION IN ALUMINUM RODSAT ELEVATED TEMPERATURES.
AD-629 968 FLD. 20/11

•BROWN UNIV PROVIDENCE R I METALS RESEARCH LAB

• • •

PHYSICAL RESEARCH ON PROPERTIES OF II-VICOMPOUND SEMI CONDUCTORS.
(ARL-65-123)

AD-629 476 FLD. 20/12

•BUNKER-RAMO CORP CANOGA PARK CALIF
• • •
COMPUTER PROCESSING AND CULTURAL DATA:PROBLEMS OF METHOD, (AFOSR-65-2263)
AD-629 369 FLD. 9/2

•BUREAU OF MEDICINE AND SURGERY WASHINGTON D C
• • •
NAVMED-MR005.08-1200-2
THE SEQUENCE OF EVENTS IN RADIATIONCARCINOGENESIS: A UNIFYING FORMULATION,
AD-629 917 FLD. 6/18
• • •
NAVMED-MR005.09-1601.7-8
HAEMOGLOBIN J AND E IN A THIA KINDRED.
AD-629 459 FLD. 6/5
• • •
NAVMED-MR005-13-6001-119
OTOLITH ORGAN ACTIVITY WITHIN EARTHSTANDARD, ONE-HALF STANDARD, AND ZERO GRAVITYENVIRONMENTS,
AD-629 323 FLD. 6/19

•BUREAU OF NAVAL WEAPONS WASHINGTON D C
• • •
NAVWEPS-8824
THE ELASTIC SCATTERING OF LOW ENERGYELECTRONS FROM ATOMIC HELIUM.
AD-629 519 FLD. 20/8
• • •
NAVWEPS-8990
HIGH-PRESSURE GAS FROM LITHIUM HYDRIDE ANDSEA WATER,
AD-629 513 FLD. 19/8
• • •
NAVWEPS-9003
DIFFUSION AND CONDUCTIVITY OF PLASMAS INSTRONG EXTERNAL FIELDS,
AD-629 998 FLD. 20/9
• • •
NAVWEPS-9010
USE OF AN EVAPORATED DIELECTRIC FILM FORDETERMINING THE OPTICAL CONSTANTS OF AMETAL. I AND II.
AD-629 999 FLD. 20/6

•BUREAU OF RECLAMATION DENVER COLO SOILS ENGINEERING BRANCH
• • •
EM-715
LABORATORY STUDIES ON THE EFFECTS OF LABORATORY SIMULATED EARTHQUAKE LOADINGS ONCOHESIVE SOIL STRENGTH, SAN LUIS DAM ANDCANAL-I SAN LUIS UNIT CENTRAL VALLEY PROJECT,CALIFORNIA,
AD-629 993 FLD. 8/13

•BUREAU OF SHIPS WASHINGTON D C
• • •
PROJECT SOUTHERN CROSS (NAVAL SHIPS ADVANCED COMMUNICATION SYSTEMS),
AD-629 099 FLD. 17/2.1
• • •
959
FROM OARS TO THE WATER-JET,
(TT-66-60091)
AD-629 510 FLD. 13/10
• • •
BUSHIPS TRANS. NO. 943
STRESSED STATE AROUND A CIRCULAR HOLE IN ASHELL OF REVOLUTION WITH A SHALLOW MERIDIANARC,
(TT-65-64859)
AD-629 076 FLD. 20/11

•CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE
• • •
TR-2
HARMONIC WAVE PROPAGATION IN ELASTIC RODS OFELLIPTICAL CROSS-SECTION.
AD-629 408 FLD. 20/11

•CALIFORNIA INST OF TECH PASADENA HYDRODYNAMICS LAB
• • •
E-79.9
HYDRODYNAMICS OF TURBOMACHINES.
AD-629 418 FLD. 10/1

•CALIFORNIA UNIV BERKELEY
• • •
UNLEARNING UNDER CONDITIONS OF SUCCESSIVEINTERPOLATION,
AD-629 283 FLD. 5/10

•CALIFORNIA UNIV BERKELEY DEPT OF ASTRONOMY
• • •
299
THERMODYNAMICS OF A SOLAR COMPOSITIONGASEOUS MIXTURE,
(AFOSR-65-2199)
AD-629 535 FLD. 3/2

•CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
• • •
PHOTONS AND GRAVITONS IN PERTURBATIONTHEORY: DERIVATION OF MAXWELL'S ANDEINSTEIN'S EQUATIONS.
(AFOSR-65-1823)
AD-629 562 FLD. 20/10
• • •
COMMENTS ON RELATIVISTIC SUPERMULTIPLETTHEORIES,
(AFOSR-65-1815)
AD-629 573 FLD. 20/8
• • •
A STUDY OF SOME APPROXIMATION SCHEMES INQUANTUM MECHANICS,
(AFOSR-65-2190)
AD-629 594 FLD. 20/10
• • •
SOLUTION OF A BETHE-SALPETER EQUAON,
(AFOSR-65-2192)
AD-629 596 FLD. 20/8
• • •
NUMERICAL SOLUTION OF FIXED-SOURCE FIELDTHEORIES,
(AFOSR-65-2191)
AD-629 597 FLD. 20/10

•CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
• • •
PLASMA RESEARCH.
AD-629 424 FLD. 20/9
• • •
A UNIFIED THEORY OF SYNTHESIS WITH UNSYMMETRIC FOUR-ELEMENT LOSSLESS LATTICES,
(AFOSR-65-2444)
AD-629 576 FLD. 9/5
• • •
ANODE STRUCTURES FOR COLD-CATHODE HIGHPOWER MAGNETRONS.
(AFOSR-65-2194)
AD-629 583 FLD. 9/1

•CALIFORNIA UNIV BERKELEY INST OF ENGINEERING RESEARCH
• • •
AS-65-16
SPHERE DRAG AT HIGH KNUDSEN NUMBER ANDLOW MACH NUMBER.
AD-629 622 FLD. 20/4

•CALIFORNIA UNIV BERKELEY SPACE SCIENCES LAB
• • •
SSL(UC)-6-50
SOLAR SYSTEM MAGNETIC FIELDS AND PLASMAS.
AD-629 178 FLD. 3/2

•CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
• • •
TR-8
THE VISCOELASTIC RELAXATION MECHANISM OFINORGANIC POLYMERS. IV. SIMULTANEOUSMULTIPLE MECHANISMS.
AD-629 329 FLD. 11/9
• • •
TR-10
GLASS TRANSITIONS IN IONIC POLYMERS.
AD-629 330 FLD. 11/9
• • •
TR-11
VISCOELASTIC RELAXATION MECHANISMS OFINORGANIC POLYMERS. V. COUNTERION EFFECTSIN BULK POLYELECTROLYTES.
AD-629 331 FLD. 11/9

•CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
• • •
65-45
A BRIEF COMMENT ON THE HYDRAULIC ANALOGYOF AN ACOUSTIC WAVE IN A PIPE,
AD-629 088 FLD. 20/14
• • •
65-46
A HYDRAULIC ANALOG STUDY OF THE HARTMANNOSCILLATOR PHENOMENON,
AD-629 085 FLD. 20/4
• • •
65-48
THE PROPAGATION PATH OF A WAVE IN AVARIABLE SPEED OF SOUND MEDIUM OBTAINEDBY EMPLOYING FERMAT'S PRINCIPLE,
AD-629 084 FLD. 20/14
• • •
65-49
FLUID MOTION AND SOUND.
AD-629 087 FLD. 20/4
• • •
65-50
A STUDY OF SOME ASPECTS OF JET FLOWS ANDEDGE-TONES,
AD-629 086 FLD. 20/4
• • •
UCLA-DE-65-53
UPPER EXTREMITY PROSTHETICS RESEARCH.HUMAN TRACKING. SENSORY MOTOR CONTROL.MYOELECTRIC CONTROL.
AD-624 990 FLD. 6/5

•CALIFORNIA UNIV LOS ANGELES DEPT OF MEDICAL MICROBIOLOGY AND IMMUNOLOGY
• • •
HOST PRECIPITIN ANTIBODY PRODUCTION INRELATION TO DIFFERENTIATION AND GROWTH OFPARASITIC ROUNDWORMS.
AD-629 029 FLD. 6/3

•CALIFORNIA UNIV RIVERSIDE
• • •
THE ELECTRICAL PROPERTIES OF SEMIPERMEABLEMEMBRANES.
AD-629 470 FLD. 7/4

•CALIFORNIA UNIV RIVERSIDE DEPT OF CHEMISTRY
• • •
THERMODYNAMICS OF THE LIQUID-LIQUIDCRITICAL MIXING REGION.
(AFOSR-64-1758)
AD-629 459 FLD. 20/13

•CALIFORNIA UNIV SAN DIEGO DEPT OF PHYSICS
• • •
TR-36
ONE-PARTICLE PROPERTIES OF AN INHOMOGENEOUS INTERACTING ELECTRON GAS.
AD-629 343 FLD. 7/4

•CAMBRIDGE LANGUAGE RESEARCH UNIT (ENGLAND)
• • •
A SEQUENTIAL LOGIC FOR

INFORMATION STRUCTURING.
(AFOSR-65-1883)
AD-625 988 FLD. 12/1

•CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS

• • •

THE PROBLEM OF CAUSALITY IN S-MATRIXTHEORY.
(AFOSR-65-1782)
AD-625 957 FLD. 20/10

• • •

A MODEL REQUIRING LIE GROUP SYMMETRIES.
(AFOSR-65-2183)
AD-625 958 FLD. 20/8

•CARNEGIE INST OF TECH PITTSBURGH PA

• • •

SYNTAX ANALYSIS BY A PRODUCTION LANGUAGE.
AD-625 965 FLD. 9/2

•CARNEGIE INST OF TECH PITTSBURGH PA METALS RESEARCH LAB

• • •

OPTICAL PROPERTIES OF METALS AND ALLOYS.
(AFOSR-65-1843)
AD-625 971 FLD. 11/6

•CATHOLIC UNIV OF AMERICA WASHINGTON D C

• • •

FINITE DEFORMATIONS UNDER PRESSURIZATION INAN INFINITELY LONG, THICK-WALLED, NONLINEARLYVISCOELASTIC CYLINDER IDEALLY BONDED TO A THINELASTIC CASE.
AD-625 219 FLD. 20/11

•CATHOLIC UNIV OF AMERICA WASHINGTON D C DIV OF NUCLEAR SCIENCE AND ENGINEERING

• • •

THE PHYSICS AND SHIELDING ASPECTS OFHETEROGENEOUS ISOTOPIC NEUTRON SOURCES.
AD-625 906 FLD. 18/2

• • •

VARIABLE INTENSITY ISOTOPIC SOURCES.
AD-625 915 FLD. 18/2

•CATHOLIC UNIV OF AMERICA WASHINGTON D C STRESS ANALYSIS LABS

• • •

AN EXPERIMENTAL STUDY OF STRESSES AT THEINTERFACE OF PROPELLANT GRAINS AND MOTORCASES DUE TO THERMAL LOADING OF THESHRINKAGE TYPE. STRESSES IN SQUARE SLABS,WITH DIFFERENT EDGE GEOMETRIES, WHENBONDED ON ONE FACE TO A RIGID PLATE ANDSHRUNK.
AD-625 220 FLD. 21/9

•CENTRAL RADIO PROPAGATION LAB BOULDER COLO

• • •

OPTIMUM NONUNIFORMLY SPACED ANTENNAARRAYS.
(AFCRL-65-830)
AD-625 318 FLD. 9/5

• • •

CRPL-500-11-1000422
PROPAGATION OF PULSES IN DISPERSIVE MEDIA.
(AFCRL-65-435)
AD-625 139 FLD. 20/14

• • •

SR-30
PROPAGATION OF PULSES IN DISPERSIVE MEDIA.
(AFCRL-65-435)
AD-625 139 FLD. 20/14

•CHATHAM ELECTRONICS DIV TUNG-SOL ELECTRIC INC LIVINGSTON N J

• • •

HIGH SPEED POWER AMPLIFIER USING ANELECTRON SWITCHED P-N JUNCTION.
AD-625 920 FLD. 9/5

•CHICAGO UNIV ILL DEPT OF CHEMISTRY

• • •

TR-18
MAGNETIC ORDERING IN VF2.
AD-625 211 FLD. 7/4

•CINCINNATI UNIV OHIO DEPT OF AEROSPACE ENGINEERING

• • •

TR-AE-6505
MEASUREMENT OF THE HEAT TRANSFER TO ATWO-DIMENSIONAL HYPERSONIC INLET WITHVARIABLE GEOMETRY.
AD-625 095 FLD. 20/13

•CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF

• • •

EXPERIMENTAL AND ANALYTICAL STUDIES INCONTINUUM HYPERSONIC FLOW.
(ARL-65-183)
AD-625 209 FLD. 20/4

• • •

EXPERIMENTAL INVESTIGATIONS OF HYPERSONICFLOW AROUND TWO-DIMENSIONAL CIRCULARCYLINDERS.
(ARL-65-212)
AD-625 384 FLD. 20/4

• • •

CALCULATION OF THE FORCE COEFFICIENT FORDELTA WINGS IN HYPERSONIC FLOW.
(ARL-65-182)
AD-625 404 FLD. 20/4

•CLARENDON LAB UNIV OF OXFORD (ENGLAND)

• • •

INVESTIGATION OF THE PROPERTIES OF HOTPLASMA GASES AND MEASUREMENT OF GASTEMPERATURES NEAR SOLID SURFACES.
(AFML-TR-65-419)
AD-625 043 FLD. 20/9

•COLORADO UNIV BOULDER

• • •

DEVELOPING A SYSTEM OF SOLAR FLAREPREDICTION.
AD-625 538 FLD. 3/2

• • •

TR-17
A COGNITIVE DETERMINANT OF IMPRESSIONFORMATION.
AD-625 019 FLD. 5/10

•COLORADO UNIV BOULDER LAB FOR ATMOSPHERIC AND SPACE PHYSICS

• • •

THE DESIGN AND DEVELOPMENT OF A HIGHRESOLUTION ECHELLE VACUUM SPECTROGRAPHAND ITS APPLICATION TO THE MEASUREMENT OFTHE MOLECULAR CONSTANTS OF THE 1Σ(+) STATEOF NO(+).
(AFCRL-6670)
AD-625 337 FLD. 20/6

•COLUMBIA RADIATION LAB NEW YORK

• • •

TR-3
THE EFFECTS OF OPTICAL PUMPING ON THERB87 MASER OSCILLATOR.
AD-624 929 FLD. 20/5

•COLUMBIA UNIV NEW YORK

• • •

THE RELATION BETWEEN CRANIOCEREBRALTRAUMA AND ITS SEQUELAE.
AD-625 031 FLD. 6/5

•COMISION NACIONAL DE ENERGIA ATOMICA BUENOS AIRES (ARGENTINA) DEPARTAMENTO DE METALURGIA

• • •

POINT DEFECTS AND MECHANICAL PROPERTIES OFCOLUMBIUM.
AD-625 975 FLD. 11/6

•COMISION NACIONAL DE INVESTIGACIONES ESPACIALES BUENOS AIRES (ARGENTINA)

• • •

CNIE-PE-2
INTERNATIONAL YEARS OF THE QUIET SUNVOLUME I (ANOS INTERNACIONALES DEL SOL CALMO).
(AFOSR-65-1730)
AD-625 036 FLD. 4/1

•CONDUCTRON CORP ANN ARBOR MICH

• • •

BR/D-3
FILM RADAR ABSORBING MATERIAL PROGRAM.
AD-625 386 FLD. 17/4

•CONESCO INC CAMBRIDGE MASS

• • •

CONESCO-4841-1
SHIP HULL VIBRATIONS - 9: A GUIDE FOR DESIGNSTAGE CALCULATIONS OF PROPELLAR EXCITEDVIBRATIONS.
AD-625 385 FLD. 13/10

•CONTINENTAL AVIATION AND ENGINEERING CORP DETROIT MICH

• • •

TN-345
AXIAL COMPRESSOR DESIGN USING ISENTROPICOR NONISENTROPIC SIMPLE RADIAL EQUILIBRIUMEQUATION.
AD-625 079 FLD. 13/7

•CONTROLS FOR RADIATION INC CAMBRIDGE MASS

• • •

INVESTIGATION OF RADIATION INDUCED SEMICONDUCTOR PROPERTIES IN ORGANIC AND INORGANICMATERIALS.
(AFCRL-65-720)
AD-624 884 FLD. 20/12

•CORNELL AERONAUTICAL LAB INC BUFFALO N Y

• • •

A PROBE FOR THE MEASUREMENT OF HIGH SURFACETEMPERATURES.
(AFFDL-TR-65-121)
AD-624 888 FLD. 14/2

• • •

CAL-BB-1840-S-1
AIR LOADINGS ON A ROTOR BLADE AS CAUSEDBY TRANSIENT INPUTS OF COLLECTIVE PITCH.
(USAAVLABS-TR-65-65)
AD-624 860 FLD. 1/1

•CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS

• • •

RESEARCH ON SOFT X-RAY ABSORPTION.
AD-625 215 FLD. 20/12

•DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB

• • •

DTMB-2017
INVESTIGATION OF SELF-EXCITED PLANINGVIBRATION AT LARGE WETTED ASPECT RATIO.
AD-625 339 FLD. 13/10

• • •

DTMB-2076
WAKE ANALYSIS OF SHIP MODELS; SINGLE-SCREWMERCHANT-TYPE.
AD-625 327 FLD. 13/10

•DAVIDSON LAB STEVENS INST OF TECH HOBOKEN N J

• • •

SIT(DL)1091

THE EFFECT OF WAVES, LOADING, AND CONFIGURATION ON THE TAKE-OFF PERFORMANCE OF WATERBASED AIRCRAFT,
AD-625 368 FLD. 1/2

•DAYTON UNIV OHIO RESEARCH INST
• • •
COMPARISON OF TRANSIENT COMPRESSORS FORTHE PRODUCTION OF HIGH TEMPERATURE ANDHIGH DENSITY GASES.
(ARL-65-181)
AD-625 570 FLD. 7/1

•DECO ELECTRONICS INC BOULDER COLO
• • •
59-F-1
OMEGA NAVIGATIONAL SYSTEM CONDUCTIVITYMAP.
AD-625 490 FLD. 17/7

•DEFENCE CHEMICAL BIOLOGICAL AND RADIATION LABS OTTAWA (ONTARIO)
• • •
PENETRATION OF GUINEA PIG AND RABBIT SKINBY DIMETHYL SULFOXIDE SOLUTIONS OF AQUATERNARY OXIME,
AD-625 935 FLD. 6/15

•DEFENCE RESEARCH BOARD OTTAWA (ONTARIO)
• • •
ABSTRACTS OF PAPERS FOR WHICH THE RESEARCHWAS SUPPORTED IN PART BY GRANT 2801-21.
AD-624 903 FLD. 4/1

•DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)
• • •
DRML-RP-553
SPEAKING AND LISTENING THROUGH THE HEAD:I. THE INTELLIGIBILITY OF SPEECH RECORDED INQUIET AT DIFFERENT POSITIONS ON THE HEAD ANDTHROAT,
AD-625 109 FLD. 17/2
• • •
DRML-RP-565
THEORETICAL ASPECTS OF THE ROLE OF ANGULARACCELERATION IN VESTIBULAR STIMULATION.
AD-625 439 FLD. 6/19
• • •
DRMLRP-591
PROBABILITY LEARNING IN STEP-INPUT TRACKING.
AD-625 103 FLD. 5/10
• • •
RP-583
BAR PRESSING BY THE RAT AS A FUNCTION OFAUDITORY STIMULATION,
AD-625 102 FLD. 5/10

•DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO) SENSORY CAPACITIES SECTION
• • •
A SEALED SWITCH.
AD-625 922 FLD. 9/5

•DEFENSE ATOMIC SUPPORT AGENCY WASHINGTON D C
• • •
DASA-1708
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERICGASES.
AD-625 480 FLD. 4/1

•DEFENSE RESEARCH LAB UNIV OF TEXAS AUSTIN
• • •
DRL-A-250
A STANDARDIZED TRANSDUCER CALIBRATIONSYSTEM FOR NAVAL SHIPYARD TRANSDUCER REPAIRFACILITIES,
AD-624 926 FLD. 14/2

•DELAWARE UNIV NEWARK DEPT OF PHYSICS
• • •
TR-4
THE INSTABILITY OF NEGATIVE DIFFERENTIALRESISTANCE.
AD-625 273 FLD. 20/3

•DELCO RADIO DIV GENERAL MOTORS CORP KOKOMO IND
• • •
STUDY OF GERMANIUM DEVICES FOR USE IN ATHERMOPHOTOVOLTAIC CONVERTER.
AD-624 868 FLD. 9/1

•DENVER UNIV COLO DEPT OF PHYSICS
• • •
BALLOON BORNE INFRARED STUDIES.
(AFCRL-65-755)
AD-625 349 FLD. 4/1

•DEPARTMENT OF THE NAVY WASHINGTON D C
• • •
TRANSLATION-2037
PLASTIC MARINE FITTINGS,
(TT-66-60103)
AD-625 614 FLD. 13/10
• • •
TRANSLATION-2039
GAS IN THE CHEMICAL INDUSTRY,
(TT-66-60101)
AD-625 612 FLD. 7/3
• • •
TRANSLATION-2042
THE INVALIDITY OF A PURELY THERMODYNAMICTREATMENT OF THE ADHESION OF SOLIDS,
(TT-66-60096)
AD-625 603 FLD. 7/4
• • •
TRANSLATION-2043
REACTIONS OF CHLOROMETHYLSILANES ANDSILOXANE WITH DEHYDRIC PHENOLS,
(TT-66-60102)
AD-625 613 FLD. 11/9

•DEUTSCHER WETTERDIENST OFFENBACH AM MAIN (WEST GERMANY)
• • •
THE NULL LAYER CONCEPTION IN STRATOSPHEREAND MESOSPHERE, ESPECIALLY IN SPRING ANDFALL.
AD-625 216 FLD. 4/2

•DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
• • •
T-922-R
LIQUID-VAPOR PHASE EQUILIBRIUM OF ALCOHOL WATER MIXTURES IN THE PRESENCE OF CERTAINSALTS, AT ATMOSPHERIC PRESSURE,
(TT-66-60090)
AD-625 931 FLD. 7/4
• • •
T-923-R
ON THE PROBLEM OF SEPARATING HYDROAZEOTROPES,
(TT-66-60089)
AD-625 930 FLD. 7/4

•DOW CHEMICAL CO MIDLAND MICH SCIENTIFIC PROJECTS LAB
• • •
SYNTHESIS AND EVALUATION OF NEW FIRERESISTANT HYDRAULIC FLUIDS.
AD-625 209 FLD. 11/8

•DUKE UNIV DURHAM N C
• • •
SOME PERSONAL AND SITUATIONAL FACTORSRELEVANT TO THE CONSISTENCY AND PREDICTION OFCONFORMING BEHAVIOR,
AD-625 280 FLD. 5/10
• • •
BASES AND CONSEQUENCES OF SYSTEMS OF COMMUNICATION.
AD-625 922 FLD. 5/10

•DUKE UNIV DURHAM N C DEPT OF CHEMISTRY
• • •
ALKYLATIONS OF PHENYLACETIC, ALPHAALKYLPHENYLACETIC, AND DIPHENYLACETIC ESTERSBY MEANS OF SODAMIDE AND SODIUM HYDRIDE,
(AROD-3581:10)
AD-625 634 FLD. 7/3
• • •
TETRASODIO BIS-BETA-DIKETONES.DICONDENSATIONS WITH ELECTROPHILICCOMPOUNDS,
(AROD-3581:9)
AD-625 635 FLD. 7/3

•DUNLAP AND ASSOCIATES INC DARIEN CONN
• • •
SYSTEMS ANALYSIS OF AAW TRAINING REQUIREMENTS.
AD-625 378 FLD. 5/9
• • •
SSD-65-172(5143)R
CONCEPTS AND PRACTICES IN THE ASSESSMENTOF HUMAN PERFORMANCE IN AIR FORCE SYSTEMS.
(AMRL-TR-69-168)
AD-625 041 FLD. 5/10
• • •
SSD-65-245 (5946)
TRAINING REQUIREMENTS FOR POSTATTACKADAPTIVE BEHAVIOR.
AD-624 870 FLD. 15/3

•DUNLAP AND ASSOCIATES INC WASHINGTON D C
• • •
RESEARCH ON CONSIDERATION OF TRAININGFUNCTIONS DURING DESIGN OF OPERATIONALEQUIPMENT.
AD-625 129 FLD. 5/9

•EATON ELECTRONICS RESEARCH LAB MCGILL UNIV MONTREAL (QUEBEC)
• • •
CONCENTRATION DEPENDENCE OF SPIN-LATTICERELAXATION TIME OF COLOR CENTERS IN QUARTZ,
AD-625 098 FLD. 20/2
• • •
THE EFFECT OF PRESSURE ON THE FERROMAGNETICPHASE TRANSITION OF EUO,
AD-625 105 FLD. 20/12

•ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
• • •
EERL-96
A SYNTHESIS METHOD FOR LINEAR TIME-VARYINGSYSTEMS.
AD-624 983 FLD. 9/3
• • •
TR-89
A SYNTHESIS METHOD FOR LINEAR TIME-VARYINGSYSTEMS.
AD-624 983 FLD. 9/3

•ELECTRO TECHNICAL ANALYSIS CORP TUCSON ARIZ
• • •
FREQUENCY ASSIGNMENT STUDIES.
AD-625 585 FLD. 17/2.1

•ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
• • •
MICROWAVE OPTICAL RECEIVER TECHNIQUES.
AD-625 382 FLD. 17/2

•ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS
• • •
ESD-TDR-65-239
TELEMETRY ANTENNA FOR LINCOLN EXPERIMENTALSATELLITES LES-1 AND LES-2.
AD-624 936 FLD. 9/6

• • •
ESD-TDR-65-457
A SHAPED REFLECTOR AS A PRIMARY FEED FORHAYSTACK.
AD-625 375 FLD. 9/5

• • •
ESD-TDR-65-488
ON SURFACE-WAVE COUPLING BETWEENELEMENTS OF LARGE ARRAYS.
AD-625 016 FLD. 9/5

• • •
ESD-TDR-65-502
SIMPLE APPARATUS FOR APPLYING UNIAXIALPRESSURE AT VERY LOW TEMPERATURES,
AD-625 020 FLD. 14/2

• • •
ESD-TDR-65-546
THE SCALING OF DIGITAL DIFFERENTIALANALYZERS.
AD-625 021 FLD. 9/2

• • •
ESD-TDR-65-550
SPIN-ORBIT INTERACTION IN GRAPHITE,
AD-625 017 FLD. 20/12

• • •
ESD-TDR-65-552
LATERAL-FEED DISPLACEMENT IN APARABOLOID.
AD-625 018 FLD. 9/1

• • •
ESD-TDR-65-561
GRAPHICS.
AD-625 567 FLD. 5/8

• • •
ESD-TR-65-79
A COMPUTERIZED TECHNIQUE TO EXPRESSUNCERTAINTY IN ADVANCED SYSTEM COST ESTIMATES,
AD-624 899 FLD. 5/3

• • •
ESD-TR-65-405
SYSTEM COST ANALYSIS: A MANAGEMENT TOOL FORDECISION MAKING,
AD-624 893 FLD. 5/3

• • •
ESD-TR-65-477
TERMINAL WEATHER PREDICTION TECHNIQUES.
AD-625 094 FLD. 4/2

•ELECTRONICS MAINTENANCE ENGINEERING CENTER NORFOLK VA

• • •
EMEC-11-65
EVALUATION OF PROPOSED MODIFICATIONS TO THEAN/UPN-19 SERIES LORAN C RECEIVERS.
AD-625 114 FLD. 17/7

•EMORY UNIV ATLANTA GA

• • •
CHANGES IN THE JUDGMENTS OF SENSITIZERSAND REPRESSERS IN RESPONSE TO FAILURE ANDSUCCESS EVALUATIONS OF GROUP PERFORMANCE,
AD-625 022 FLD. 5/10

•ENGELHARD INDUSTRIES INC NEWARK N J RESEARCH AND DEVELOPMENT DIV

• • •
FUEL CELL CATALYSTS.
AD-625 127 FLD. 10/2

•ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL

• • •
NEUTRON MONITOR MASS ABSORPTION COEFFICIENTS AT CHICAGO AND CLIMAX DURING SOLARCYCLE 19 (1954-1963). (AFOSR-65-1820)
AD-625 600 FLD. 4/1

•EUROPEAN COUNCIL FOR NUCLEAR RESEARCH GENEVA (SWITZERLAND)

• • •
CERN-65-61
A FORTRAN PROGRAMME FOR THE ANALYSIS OFHYPERFRAGMENTS AND FOR OTHER EMULSIONSTUDIES,
AD-625 014 FLD. 18/8

•EVANS CHEMICAL LAB OHIO STATE UNIV COLUMBUS

• • •
2,3-NAPHTHOQUINONOID HETEROCYCLES. II. AHIGHLY STABILIZED THIADIAZOLE ANALOG OFANTHRACENE. (AROD-3691:4)
AD-625 636 FLD. 7/3

• • •
THE SYNTHESIS OF A PHENANTHRIDENE FROMAN AROMATIC SCHIFF BASE BY A PHOTOOXIDATIVERING CLOSURE. (AROD-3691:3)
AD-625 637 FLD. 7/3

• • •
THE PHOTOLYTIC DECOMPOSITION OF SOMESULFONES BY AN INTERNALLY SENSITIZED PATH, (AROD-3691:2)
AD-625 638 FLD. 7/3

•FAIRCHILD SEMICONDUCTOR RESEARCH AND DEVELOPMENT LABS PALO ALTO CALIF

• • •
UHF SMALL SIGNAL TRANSISTOR.
AD-625 433 FLD. 9/1

•FALKINER NUCLEAR DEPT UNIV OF SYDNEY (AUSTRALIA)

• • •
ENERGY ESTIMATION FOR HIGH-ENERGY NUCLEARINTERACTIONS, (AFOSR-65-1811)
AD-625 564 FLD. 20/8

•FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY WASHINGTON D C

• • •
1965 CONGRESS, INTERNATIONAL FEDERATION FORDOCUMENTATION (FID), 10-15 OCTOBER 1965,WASHINGTON, D. C.: ABSTRACTS. (AFOSR-65-1891)
AD-625 498 FLD. 5/2

•FLORIDA STATE UNIV TALLAHASSEE DEPT OF CHEMISTRY

• • •
X-RAY DIFFRACTION STUDIES OF THE MELTINGOF LINEAR POLYETHYLENE, (AROD-4222:5)
AD-625 176 FLD. 7/3

• • •
A CALORIMETRIC STUDY OF THE FUSION OFMOLECULAR WEIGHT FRACTIONS OF LINEARPOLYETHYLENE, (AROD-4222:6)
AD-625 177 FLD. 7/3

•FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

• • •
RESEARCH ON SYNTHESIS OF UNSATURATEDFLUOROCARBON COMPOUNDS.
AD-624 867 FLD. 11/10

•FOOTE MINERAL CO BERWYN PA

• • •
RADIATION ABSORBING GLASS. (FA-R-1778)
AD-624 874 FLD. 11/2

•FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

• • •
FTD-MT-64-273
AVIATION HANDBOOK (FOR THE PILOT ANDNAVIGATOR), (TT-66-60062)
AD-625 284 FLD. 1/2

• • •
FTD-MT-64-482
ANALYSIS OF FLOW NEAR A BLUNT SOLID OFREVOLUTION AT ANGLE OF ATTACK IN SUPERSONICFLOW OF GAS, (TT-66-60044)
AD-625 236 FLD. 20/4

• • •
FTD-MT-65-09
STRUCTURAL, CORRELATION, AND SPECTRALFUNCTIONS OF INTERSTELLAR GAS TURBULENCE, (TT-65-64821)
AD-624 914 FLD. 3/2

• • •
FTD-MT-65-64
FIVE YEARS OF SOVIET SPACE INVESTIGATION, (TT-66-60077)
AD-625 300 FLD. 22/2

• • •
FTD-MT-65-99
NEW METHODS OF PLASMA DIAGNOSTICSACCORDING TO SPECTROSCOPIC DATA, (TT-66-60045)
AD-625 239 FLD. 20/9

• • •
FTD-TT-64-708
COHERENCE PROPERTIES OF ELECTROMAGNETICRADIATION, (TT-65-64834)
AD-625 038 FLD. 20/6

• • •
FTD-TT-64-718
ABOUT RADIATION INJURIES TO RADIOCOMPONENTS IN A SHARP GAMMA-RADIATIONFIELD, (TT-65-64835)
AD-625 039 FLD. 18/8

• • •
FTD-TT-64-1092
STUDY OF FRICTION OF POLYAMIDES ON STEEL, (TT-66-60081)
AD-625 304 FLD. 11/9

• • •
FTD-TT-64-1094
MECHANICAL STRENGTH OF HIGHLY ALUMINOUSCERAMIC, (TT-66-60074)
AD-625 296 FLD. 11/2

• • •
FTD-TT-65-359
A MICROWAVE NOISE SOURCE OF GAS DISCHARGEFOR CIRCULAR WAVEGUIDES, (TT-66-60097)
AD-625 261 FLD. 9/5

• • •
FTD-TT-65-496
POLAROGRAPHIC DETERMINATION OF ACROLEININ THE OXIDATION PRODUCTS OF PROPYLENE ONCOPPER CATALYSTS, (TT-65-64841)
AD-625 097 FLD. 7/3

• • •
FTD-TT-65-634
METHOD OF COLLECTING INFORMATION IN ALONG TERM MEMORY DEVICE, (TT-66-60096)
AD-625 240 FLD. 9/2

• • •
FTD-TT-65-669
EXPERIMENTAL STUDY OF A MODEL CONTROLBLEEDER STAGE WITH A ROTATING DIAPHRAGM, (TT-66-60033)
AD-625 194 FLD. 21/5

• • •
FTD-TT-65-671
DIMENSIONLESS CHARACTERISTICS OF GAS TURBINEUNITS WITH SLITTED SHAFTS, (TT-66-60026)
AD-625 182 FLD. 21/5

• • •
FTD-TT-65-672
NERVES OF IRON, (TT-66-60047)
AD-625 241 FLD. 6/5

• • •
FTD-TT-65-680
THERMAL RESISTANCE OF TAIL CONNECTIONS OFTURBINE BLADES, (TT-66-60048)
AD-625 242 FLD. 21/5

• • •

FTD-TT-65-688
PROTECTION FROM MASS-DESTRUCTION WEAPONS,
(TT-66-60032)
AD-625 192 FLD. 5/9

• • •

FTD-TT-65-722
REACTION OF ORGANOCYCLOSILAZANE WITHDIHYDROXY POLYORGANOSILOXANES,
(TT-65-64838)
AD-625 059 FLD. 11/10

• • •

FTD-TT-65-740
ULTRASONIC DEFECTOSCOPY OF TUBES,
(TT-66-60043)
AD-625 229 FLD. 13/8

• • •

FTD-TT-65-751
SCIENCE BULLETIN (SELECTED ARTICLES),
(TT-65-64861)
AD-625 090 FLD. 14/2

• • •

FTD-TT-65-793
DEVICE FOR THE ANALYSIS OF THE INSTANTANEOUSSPECTRUM OF A VOICE SIGNAL IN HARMONICDECODERS,
(TT-66-60036)
AD-625 197 FLD. 20/1

• • •

FTD-TT-65-794
METHOD OF OBTAINING LUBRICANT FOR HOTWORKING OF METALS,
(TT-65-64831)
AD-625 000 FLD. 11/8

• • •

FTD-TT-65-795
ANTIWEAR ADDITIVE FOR LUBRICATING OILS,
(TT-65-64837)
AD-625 053 FLD. 11/8

• • •

FTD-TT-65-796
METHOD OF BONDING POLYAMIDES TO METALS,
(TT-66-60042)
AD-625 228 FLD. 13/8

• • •

FTD-TT-65-803
AMMONIA MASER (AMMONIA MOLECULARGENERATOR),
(TT-66-60039)
AD-625 196 FLD. 20/5

• • •

FTD-TT-65-839
ANALYTICAL CONSTRUCTION OF THE GUIDANCESYSTEM OF ROCKETS,
(TT-66-60000)
AD-625 093 FLD. 16/2

• • •

FTD-TT-65-857
NEW ANTIFRICTION AND CHEMICALLY STABLEMATERIALS,
(TT-65-64863)
AD-625 092 FLD. 11/9

• • •

FTD-TT-65-869
EQUATIONS OF TRANSVERSE VIBRATIONS OFFLUID-FILLED SHELLS,
(TT-65-64826)
AD-625 092 FLD. 20/11

• • •

FTD-TT-65-925
ON THE WIDTH OF COMBINED RESONANCE BANDS,
(TT-TT-66-60079)
AD-625 302 FLD. 7/4

• • •

FTD-TT-65-937
HYDRAULIC RESISTANCE AND HEAT AND MASSTRANSFER IN A VORTICAL FLOW,
(TT-66-60067)
AD-625 289 FLD. 20/4

• • •

FTD-TT-65-976
PROPERTIES AND USES OF RHENIUM,
(TT-65-64812)
AD-624 909 FLD. 11/6

• • •

FTD-TT-65-986
STUDYING THE EFFECT OF ADDITIONS TO POLYCAPROLACTAM 'B' ON ANTIFRICTION PROPERTIESAND ADHESION TO METAL,
(TT-66-60069)
AD-625 286 FLD. 11/9

• • •

FTD-TT-65-990
PNEUMATIC CONVERTER,
(TT-65-64813)
AD-624 906 FLD. 13/7

• • •

FTD-TT-65-991
DEVICE FOR SPRAYING FERROMAGNETIC FILMS ONA SUBSTRATE IN A VACUUM,
(TT-66-60063)
AD-625 285 FLD. 13/9

• • •

FTD-TT-65-994
REFLECTION OF SPHERICAL ELASTIC WAVE FROMTHE BOUNDARY OF SEMISPACE,
(TT-65-64827)
AD-624 924 FLD. 20/11

• • •

FTD-TT-65-995
METHOD OF PIERCING THE SELECTING MATRIXOF A MEMORY,
(TT-66-60066)
AD-625 288 FLD. 9/2

• • •

FTD-TT-65-996
BALANCED MIXER,
(TT-66-60065)
AD-625 287 FLD. 9/1

• • •

FTD-TT-65-1004
CALCULATION OF COMPOSITION OF EXPLOSIVESAND DETONATION PARAMETERS OF CONDENSEDEXPLOSIVES,
(TT-66-60011)
AD-625 150 FLD. 19/1

• • •

FTD-TT-65-1009
MUTUAL SOLUBILITY OF COPPER AND MOLYBDENUMAND CERTAIN PROPERTIES OF ALLOYS OF MOLYBDENUMWITH COPPER,
(TT-65-64815)
AD-624 908 FLD. 11/6

• • •

FTD-TT-65-1010
RECRYSTALLIZATION OF HIGH-MELTING METALSIN WELDING AND SOLDERING,
(TT-65-64816)
AD-624 909 FLD. 13/8

• • •

FTD-TT-65-1013
MOUNTING DEVICE FOR CAISSON PUMPS,
(TT-66-60002)
AD-625 141 FLD. 13/11

• • •

FTD-TT-65-1014
REMOTE STARTING DEVICES FOR GAS TURBINES,
(TT-66-60005)
AD-625 144 FLD. 21/5

• • •

FTD-TT-65-1018
THE TRANSIENT THEORY OF THERMALSELF-IGNITION,
(TT-66-60012)
AD-625 151 FLD. 21/2

• • •

FTD-TT-65-1020
CHARACTERISTICS OF MICROCONTAMINATIONS INAVERAGE DISTILLATE FUELS,
(TT-66-60010)
AD-625 149 FLD. 21/5

• • •

FTD-TT-65-1024
SPECIFIC FEATURES IN SOLDERING COPPER WITHGALLIUM-BASE SOLDERS,
(TT-66-60006)
AD-625 145 FLD. 13/8

• • •

FTD-TT-65-1025
EXPERIMENT IN THE USE OF EI 893 ALLOY FORGAS-TURBINE BLADES,
(TT-66-60068)
AD-625 290 FLD. 21/5

• • •

FTD-TT-65-1027
RESULTS OF TESTING THE STAGES OF CENTRIFUGALPUMPS WITH VARIOUS FLOW TWISTS AT THE INPUTINTO THE WHEEL,
(TT-66-60069)
AD-625 291 FLD. 13/11

• • •

FTD-TT-65-1030
AERODYNAMICS AND HEAT TRANSFER OF A FLATTURBULENT STREAM FLOWING ALONG A FLATSURFACE,
(TT-65-64840)
AD-625 056 FLD. 20/4

• • •

FTD-TT-65-1034
BASES OF BURNER THEORY FOR LIQUID FUEL WITHGAS GENERATOR,
(TT-65-64822)
AD-624 919 FLD. 21/2

• • •

FTD-TT-65-1039
EFFECT OF OIL OXIDATION ON THE PROCESS OFRUNNING-IN A RING-SOCKET PAIR IN AN INTERNALCOMBUSTION ENGINE,
(TT-65-64817)
AD-624 910 FLD. 21/7

• • •

FTD-TT-65-1048
GRANDIOSE ARE THE ACHIEVEMENTS OF SCIENCE,
(TT-66-60003)
AD-625 142 FLD. 21/3

• • •

FTD-TT-65-1050
PROBLEM OF THE BEHAVIOR OF HEAT RESISTANTALLOYS IN CONTACT WITH SODIUM IN STRESSEDSTATE,
(TT-66-60009)
AD-625 148 FLD. 11/6

• • •

FTD-TT-65-1054
CALCULATING THE INTERDEPENDENCE OFMACHINE SUBASSEMBLIES IN DETERMININGRELIABILITY,
(TT-66-60078)
AD-625 301 FLD. 14/4

• • •

FTD-TT-65-1055
THERMOELECTRIC COOLING AND ITS PRACTICALAPPLICATION,
(TT-66-60070)
AD-625 292 FLD. 13/1

• • •

FTD-TT-65-1056
PROBLEMS OF SEMICONDUCTOR CHEMISTRY,
(TT-66-60007)
AD-625 146 FLD. 7/2

• • •

FTD-TT-65-1063
DETERMINING THE ELASTICITY OF SATURATEDVAPORS OF LUBRICATING MATERIALS,
(TT-66-60016)
AD-625 155 FLD. 11/8

• • •

FTD-TT-65-1064
INSOLUBLE RESIDUES, FORMING DURING THEHEATING OF JET FUELS,
(TT-66-60004)
AD-625 143 FLD. 21/4

• • •

FTD-TT-65-1071
EXPERIMENTAL INVESTIGATION OF THE INFLUENCEOF LOAD ALTERNATION ON THE FATIGUE STRENGTHAND LONGEVITY OF COMPONENTS WITH AND WITHOUT STRESS CONCENTATION. COMMUNICATION II,
(TT-66-60008)
AD-625 147 FLD. 20/11

• • •

FTD-TT-65-1072
INFLUENCE OF HEAT TREATMENT ON THEPHYSICOMECHANICAL PROPERTIES OF

STEELS OF THEAUSTENITE-MARTENSITE CLASS,
(TT-66-60071)
AD-629 293 FLD. 11/6

• • •

FTD-TT-65-1073
A STUDY OF ANTIFRICTION ALLOYS OF THE'ALCUSIP' TYPE,
(TT-65-64818)
AD-629 911 FLD. 11/6

• • •

FTD-TT-65-1074
EFFECT OF GAMMA RADIATION ON THE FLUORESCENT YIELD OF RUBY,
(TT-66-60072)
AD-629 294 FLD. 20/2

• • •

FTD-TT-65-1076
APPROXIMATE SOLUTION OF THE PROBLEM OFBENDING OF A SHALLOW SPHERICAL SHELL WEAKENEDBY AN APERTURE,
(TT-66-60013)
AD-629 152 FLD. 20/11

• • •

FTD-TT-65-1078
ON THE THEORY OF THE CONVERSION OF THEFREQUENCY OF LIGHT WAVES BY A CRYSTAL,
(TT-66-60082)
AD-629 311 FLD. 20/6

• • •

FTD-TT-65-1079
AUTOMATIC RECOGNITION OF SPEAKING PERSONS,
(TT-66-60080)
AD-629 303 FLD. 17/2

• • •

FTD-TT-65-1081
EXTERNAL STORAGE FOR COMPUTERS,
(TT-66-60073)
AD-629 295 FLD. 9/2

• • •

FTD-TT-65-1090
STRUCTURAL IMPERFECTIONS OF METALS DURINGRECRYSTALLIZATION,
(TT-66-60015)
AD-629 154 FLD. 11/6

• • •

FTD-TT-65-1104
THE SYNTHESIS OF A SEMI-CONDUCTING COMBINATION OF MATERIALS BY THE METHOD OF RADIATIONOF GASEOUS PHASE INFUSED POLYMERIZATION,
(TT-65-64819)
AD-629 912 FLD. 11/9

• • •

FTD-TT-65-1106
ON DETONATION COMBUSTION OF HETEROGENEOUSSYSTEMS,
(TT-66-60019)
AD-629 158 FLD. 19/9

• • •

FTD-TT-65-1107
DIFFERENTIAL METHOD FOR THE NUMERICALSOLUTION OF TWO DIMENSIONAL NON-STATIONARYNAVIER-STOKES EQUATIONS FOR A COMPRESSIBLEGAS,
(TT-65-64842)
AD-629 058 FLD. 20/9

• • •

FTD-TT-65-1108
CONCERNING ONE METHOD OF SEEKING DATA AND ITSAPPLICATION IN THE REALIZATION, BY ELECTRONICCOMPUTER, OF THE ALGORITHM OF CRITICAL PATHDETERMINATION,
(TT-66-60017)
AD-629 156 FLD. 9/2

• • •

FTD-TT-65-1109
SEMICONDUCTING AND OPTICAL PROPERTIES OFDITHIOCARBAMATES OF COPPER, NICKEL, ZINCAND CADMIUM,
(TT-66-60014)
AD-629 153 FLD. 20/12

• • •

FTD-TT-65-1119
TOWARD A THEORY OF STABILITY OF POWDERCOMBUSTION,
(TT-64843)
AD-629 059 FLD. 21/2

• • •

FTD-TT-65-1119
FORCED OSCILLATIONS OF A STREAM OF AN IDEALCOMPRESSIBLE LIQUID IN A HOMOGENEOUS STRAIGHTPIPE,
(TT-65-64844)
AD-629 060 FLD. 20/9

• • •

FTD-TT-65-1121
STUDY OF LOCAL STRAIN DURING BENDING OF AHOLLOW SHAFT,
(TT-66-60051)
AD-629 245 FLD. 20/11

• • •

FTD-TT-65-1122
FLOW OF A NON-ADIABATIC SUPERSONIC FLOW OFAN IDEAL GAS AROUND A FLAT PLATE,
(TT-65-64849)
AD-629 061 FLD. 21/2

• • •

FTD-TT-65-1125
ADDITIVE TO SULFUROUS FUELS FOR HIGH-SPEEDDIESEL ENGINES,
(TT-66-60052)
AD-629 246 FLD. 21/9

• • •

FTD-TT-65-1126
ADDITIVE TO SULFUROUS FUEL,
(TT-66-60054)
AD-629 248 FLD. 21/9

• • •

FTD-TT-65-1127
METHOD OF IMPROVING THE THERMO-OXIDATIONSTABILITY OF HYDROCARBON FUELS,
(TT-66-60053)
AD-629 247 FLD. 21/9

• • •

FTD-TT-65-1128
A SYMMETRICAL FLIPFLOP,
(TT-65-64847)
AD-629 063 FLD. 9/5

• • •

FTD-TT-65-1129
BELLOWS TYPE DEVICE FOR HYDRAULICREMOTE CONTROL OF AN ACTUATOR,
(TT-66-60028)
AD-629 184 FLD. 13/7

• • •

FTD-TT-65-1130
TOTAL PRESSURE PROBE FOR A SUPERSONICGAS FLOW WITH A SLIGHTLY NONUNIFORM VELOCITYFIELD,
(TT-65-64848)
AD-629 064 FLD. 14/2

• • •

FTD-TT-65-1134
PASSAGE OF AN UNBALANCED GAS THROUGHTHE CRITICAL SECTION OF A NOZZLE,
(TT-65-64849)
AD-629 065 FLD. 20/9

• • •

FTD-TT-65-1135
FREE HEAT CONVECTION IN TURBINE CLEARANCE,
(TT-66-60059)
AD-629 269 FLD. 10/1

• • •

FTD-TT-65-1136
HYDRODYNAMIC RESISTANCE AND HEAT TRANSFEROF A HOUSED DISK WITH RADIAL FLOW IN THE GAP,
(TT-66-60031)
AD-629 187 FLD. 20/9

• • •

FTD-TT-65-1137
ON ONE MATHEMATICAL PROBLEM OF THE THEORYOF HEAT TRANSFER,
(TT-65-64850)
AD-629 066 FLD. 9/1

• • •

FTD-TT-65-1139
EFFECT OF GAMMA-RAYS C060 ON F. E. U.PARAMETERS,
(TT-66-60018)
AD-629 157 FLD. 9/1

• • •

FTD-TT-65-1141
CLOSED-CYCLE GAS-TURBINE INSTALLATION,
(TT-65-64832)
AD-629 001 FLD. 21/5

• • •

FTD-TT-65-1142
METHOD OF PROTECTING THE WORKING SURFACEOF SOLAR BATTERIES,
(TT-66-60030)
AD-629 186 FLD. 10/2

• • •

FTD-TT-65-1143
APPLICATION OF THE METHOD OF DYNAMICSTIFFNESS FOR CALCULATION OF THE FREQUENCYOF NATURAL OSCILLATIONS OF COMPOSITE SHELLS,
(TT-66-60020)
AD-629 159 FLD. 20/11

• • •

FTD-TT-65-1153
AUTOMATIC CONTROL OF POWER OF HYDROELECTRIC STATIONS BY CURRENT FLOW,
(TT-66-60027)
AD-629 183 FLD. 10/2

• • •

FTD-TT-65-1157
METHOD OF DETERMINING THE FUEL COMPONENTSIN GASEOUS MIXTURES,
(TT-66-60029)
AD-629 185 FLD. 21/9

• • •

FTD-TT-65-1158
METHOD OF AUTOMATIC WELDING OF STATIONARYOBJECTS WITH CLOSED LINEAR JOINTS,
(TT-65-64852)
AD-629 068 FLD. 13/8

• • •

FTD-TT-65-1159
METHOD OF WELDING BY THE FUSING OF BETATITANIUM ALLOYS,
(TT-65-64853)
AD-629 069 FLD. 13/8

• • •

FTD-TT-65-1160
WAR AND WEATHER,
(TT-66-60034)
AD-629 195 FLD. 15/7

• • •

FTD-TT-65-1165
A CHEMICAL REACTION PRODUCES A MICROCIRCUIT,
(TT-66-60061)
AD-629 277 FLD. 9/1

• • •

FTD-TT-65-1168
METHOD OF RETAINING AND ACCUMULATINGHIGH TEMPERATURE PLASMA IN A TRAP,
(TT-65-64854)
AD-629 070 FLD. 20/9

• • •

FTD-TT-65-1170
METHOD OF GENERATING OSCILLATIONS WITH AFREQUENCY WHICH IS DETERMINED BY THELARMOR PRECESSION FREQUENCY OF NUCLEARSPINS,
(TT-65-64855)
AD-629 071 FLD. 9/5

• • •

FTD-TT-65-1171
TRANSDUCER OF SPECTROMETER OF ELECTRONICPARAMAGNETIC RESONANCE,
(TT-65-64833)
AD-629 009 FLD. 20/6

• • •

FTD-TT-65-1174
METHOD OF SEPARATING ONE AMPLITUDEMODULATED SIGNAL FROM TWO MIXED AM SIGNALSWITH SUPERPOSED SPECTRA, BUT DIFFERENTCARRIERS,
(TT-65-64856)
AD-629 072 FLD. 9/5

• • •

FTD-TT-65-1183

INVESTIGATION OF THE FORMATION OF AN ALPHASOLID SOLUTION OF NITROGEN IN ZIRCONIUM ATHIGH TEMPERATURES.
(TT-66-60022)
AD-629 161 FLD. 13/8

• • •

FTD-TT-65-1193
METHOD OF OBTAINING LUBRICANT FOR TITANIUMPARTS,
(TT-66-60021)
AD-629 160 FLD. 11/8

• • •

FTD-TT-65-1230
DIFFERENTIAL EQUATIONS OF ELASTIC EQUILIBRIUMOF SHELLS OF ROTATION WITH MERIDIONAL RIBS ATPOWER AND TEMPERATURE LOADS,
(TT-66-60023)
AD-629 162 FLD. 20/11

• • •

FTD-TT-65-1237
A METHOD OF APPROXIMATE CONFORMAL MAPPING OF POLYGONAL REGIONS ONTO A UNIT CIRCLE,
(TT-66-60082)
AD-629 309 FLD. 12/1

• • •

FTD-TT-65-1242
ULTRASONIC MACHINE TOOL.
(TT-66-60024)
AD-629 167 FLD. 13/9

• • •

FTD-TT-65-1247
PRODUCTION PROCESS FOR FOAM PLASTICS,
(TT-66-60025)
AD-629 168 FLD. 11/9

• • •

FTD-TT-65-1252
OSCILLATIONS AND STABILITY OF A TRIPLELAYER CYLINDRICAL SHELL WITH INCOMPRESSIBLEIDEAL LIQUID,
(TT-66-60075)
AD-629 297 FLD. 20/11

• • •

FTD-TT-65-1289
MOSAIC STRUCTURE OF METALLIC POLYCRYSTALSAND EXTINCTION EFFECTS,
(TT-66-60055)
AD-629 249 FLD. 20/2

• • •

FTD-TT-65-1295
AURORAS AND IRON DEPOSITS,
(TT-66-60056)
AD-629 250 FLD. 4/1

• • •

FTD-TT-65-1331
TRANSFORMATION OF RUBBER,
(TT-69-69839)
AD-629 059 FLD. 11/10

• • •

FTD-TT-65-1619
PERTURBATIONS OF SUPERSONIC FLOW CAUSEDBY DISCRETE OR CONTINUOUSLY DISTRIBUTED HEATAND MASS FLOWS,
(TT-66-60099)
AD-629 293 FLD. 20/4

• • •

FTD-TT-65-1656
THE PROBLEM OF SELECTING OPTIMUMPARAMETERS OF A DOUBLE CASCADE GASTURBINE ENGINE,
(TT-66-60090)
AD-629 294 FLD. 21/5

• • •

FTD-TT-65-1659
RADIAL FLOW OF AN ELECTROCONDUCTIVE GASIN A MOVING MAGNETIC FIELD,
(TT-65-64820)
AD-629 913 FLD. 10/2

• • •

FTD-TT-65-1772
LOW FREQUENCY INSTABILITY OF THE NOMINALREGIME OF A LIQUID ROCKET ENGINE,
(TT-66-60076)
AD-629 298 FLD. 21/8.1

•FRANK J SEILER RESEARCH LAB AIR FORCE ACADEMY COLO

• • •

SRL-65-0004
COMPUTATIONAL PROCEDURES FOR SENSITIVITYCOEFFICIENTS IN TIME-INVARIANT MULTIVARIABLESYSTEMS.
AD-629 010 FLD. 12/1

•FRANKFORD ARSENAL PHILADELPHIA PA

• • •

FA-R-1778
RADIATION ABSORBING GLASS.
AD-629 879 FLD. 11/2

•FRANKFORD ARSENAL PHILADELPHIA PA PROPELLANT ACTUATED DEVICES DIV

• • •

R-1780
DESIGN IMPROVEMENT OF HIGH TEMPERATUREINITIATOR DESIGNATED 'INITIATOR, CARTRIDGEACTUATED: XM100.'
AD-629 512 FLD. 19/1

•FRANKFORD ARSENAL PHILADELPHIA PA QUALITY ASSURANCE DIRECTORATE

• • •

T66-1-1
ESTABLISHMENT OF QUALITY ASSURANCEREQUIREMENTS FOR AMINOGUANIDINE BICARBONATE.
AD-629 529 FLD. 19/1

•FRANKLIN INST RESEARCH LABS PHILADELPHIA PA

• • •

F-B2232
EVALUATION OF FRICTION AND WEAR CHARACTERISTICS OF MATERIALS FOR GAS-LUBRICATED BEARINGS UNDER CONDITIONS OF START-STOP, ANDWHIRL INDUCED RUBBING.
AD-629 376 FLD. 13/9

•FREIE UNIVERSITAET BERLIN (WEST GERMANY) INSTITUT FUER THEORETISCHE PHYSIK

• • •

INTERACTION OF THREE HYDROGEN ATOMS.
(AFOSR-65-1689)
AD-629 900 FLD. 20/8

•FRICK CHEMICAL LAB PRINCETON UNIV N J

• • •

IONIC COPOLYMERIZATION OF STYRENE ANDP-METHYL-STYRENE.
(AFOSR-65-2198)
AD-629 991 FLD. 11/9

•GENERAL ATOMIC SAN DIEGO CALIF JOHN JAY HOPKINS LAB FOR PURE AND APPLIED SCIENCE

• • •

GA-6699
ELECTRONIC AND IONIC REACTIONS IN ATMOSPHERICGASES.
(DASA-1708)
AD-629 980 FLD. 4/1

•GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF

• • •

GD/C-DBE-65-028
EMPIRICAL INFRARED ABSORPTION COEFFICIENTSOF H2O FROM 300K TO 3000K.
AD-629 582 FLD. 21/2

•GENERAL ELECTRIC CO SCHENECTADY N Y RESEARCH AND DEVELOPMENT CENTER

• • •

EFFECTS OF PRESSURE ON MAGNETIC INTERACTIONS.
AD-629 986 FLD. 20/3

•GEOSCIENCE LTD LA JOLLA CALIF

• • •

GLR-40
THERMAL AND ELECTRICAL CONDUCTIVITIES OFBIOLOGICAL FLUIDS AND TISSUES.
AD-629 897 FLD. 6/3

•GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX

• • •

TR-65-99
OPERATION OF TWO OBSERVATORIES.
AD-629 960 FLD. 8/11

• • •

TR-65-112
DEEP-WELL RESEARCH.
AD-629 514 FLD. 8/11

• • •

TR-65-119
DEEP-WELL RESEARCH.
AD-629 515 FLD. 8/11

• • •

TR-65-128
OPERATION OF TWO OBSERVATORIES.
AD-629 961 FLD. 8/11

• • •

TR-65-129
OPERATION OF TFSO.
AD-629 969 FLD. 8/11

•GEOTECHNICAL CORP GARLAND TEX

• • •

LONG RANGE SEISMIC MEASUREMENTS. PROJECT8.4. NEW MADRID EARTHQUAKE.
AD-629 399 FLD. 8/11

• • •

TR-65-52
OPERATION OF THE WICHITA MOUNTAINS SEISMOLOGICAL OBSERVATORY.
AD-629 962 FLD. 8/11

• • •

TR-65-58
OPERATION OF THREE OBSERVATORIES.
AD-629 516 FLD. 8/11

• • •

TR-65-96
OPERATION OF THE TONTO FOREST SEISMOLOGICALOBSERVATORY.
AD-629 967 FLD. 8/11

• • •

TR-65-120
MULTICOMPONENT STRAIN SEISMOGRAPH.
AD-629 518 FLD. 8/11

•GRADUATE AERONAUTICAL LABS CALIF INST OF TECH PASADENA

• • •

FINAL SUMMARY REPORT.
AD-629 980 FLD. 20/9

•GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y RESEARCH DEPT

• • •

RM-294J
CHAMBER FOR CONTINUOUS MIXING OF HIGHPRESSURE COMBUSTIBLE GASES.
AD-629 965 FLD. 19/2

•HAMILTON STANDARD DIV UNITED AIRCRAFT CORP WINDSOR LOCKS CONN

• • •

ELECTRON BEAM TECHNIQUES FOR FABRICATIONAND ASSEMBLY OF PARTS FOR ELECTRON TUBES.
AD-629 479 FLD. 13/8

•HARVARD COLL OBSERVATORY CAMBRIDGE MASS SOLAR DEPT

• • •

SCIENTIFIC-9
CLASSIFICATION OF SOLAR PROMINENCES FORSUNSPOT CYCLE NO. 19 - 1962.
(AFCRL-65-841)
AD-629 381 FLD. 3/2

•HARVARD UNIV CAMBRIDGE MASS

• • •

PIECEWISE POLYNOMIAL

INTERPOLATION ANDAPPROXIMATION,
AD-629 863 FLD. 12/1

• • •

ESSENTIALLY POSITIVE SYSTEMS OF LINEARDIFFERENTIAL EQUATIONS,
AD-629 876 FLD. 12/1

•HARVARD UNIV CAMBRIDGE MASS DEPT OF MATHEMATICS

• • •

FREE BOUNDARY PROBLEMS FOR VISCOUS FLOWSIN CHANNELS,
AD-629 862 FLD. 20/4

•HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND APPLIED PHYSICS

• • •

PROGRESS REPORT NO. 2, SEPTEMBER 1, 1964SEPTEMBER 1, 1965,
AD-629 921 FLD. 20/2

•HERCULES RESEARCH CENTER WILMINGTON DEL

• • •

INFLUENCE OF ENVIRONMENT ON ROVING ANDLAMINATE PROPERTIES,
AD-629 030 FLD. 11/5

•HUGHES AIRCRAFT CO NEWPORT BEACH CALIF MICROELECTRONICS DIV

• • •

EFFECT OF TRANSISTOR DESIGN PARAMETERSON RADIATION RESPONSE (SURFACE EFFECTS).
AD-629 939 FLD. 9/1

•HUGHES RESEARCH LABS MALIBU CALIF

• • •

SCIENTIFIC-1
THE CESIUM IONIZATION CROSS SECTION FROMTHRESHOLD TO 90 EV., (AFCRL-65-819)
AD-629 951 FLD. 7/4

•HUMAN ENGINEERING LABS ABERDEEN PROVING GROUND MD

• • •

TM-7-65
CROSS-COUNTRY SPEED AND DRIVER VIBRATIONALENVIRONMENT OF THE M60 MAIN BATTLE TANK,
AD-629 117 FLD. 5/5

• • •

TM-9-65
TARGET DETECTION USING BLACK-AND-WHITETELEVISION. STUDY I. THE EFFECTS OF RESOLUTION DEGRADATION ON TARGET DETECTION.
AD-629 231 FLD. 17/8

• • •

TM-10-65
TARGET DETECTION USING BLACK-AND-WHITETELEVISION. STUDY II: DEGRADED RESOLUTIONAND TARGET-DETECTION PROBABILITY.
AD-629 230 FLD. 17/8

•IIT RESEARCH INST CHICAGO ILL

• • •

IITRI-L6022-2
A NEW APPROACH TO STUDIES OF MUCUS FLOWAND CILIARY ACTIVITY.
AD-629 916 FLD. 6/12

•IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER

• • •

FORCED VAPORIZATION OF WATER, (AFOSR-65-2260)
AD-629 963 FLD. 20/13

• • •

IITRI-C206-13
DETERMINATION OF THE STRUCTURE OF O3F2. (AFOSR-65-1731)
AD-629 077 FLD. 7/2

•ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB

• • •

R-270
SET OF CUT SETS AND OPTIMUM FLOW,
AD-629 200 FLD. 9/1

• • •

R-272
ELEMENTARY COMPLETE TREE TRANSFORMATION,
AD-629 201 FLD. 9/1

•ILLINOIS UNIV URBANA DEPT OF COMPUTER SCIENCE

• • •

192
ON THE STRUCTURE AND AUTOMORPHISMS OFFINITE AUTOMATA.
AD-629 239 FLD. 9/2

•ILLINOIS UNIV URBANA DEPT OF PHYSICS

• • •

NONEQUILIBRIUM SITUATIONS INVOLVINGVACANCIES IN GOLD,
AD-629 877 FLD. 20/2

• • •

RESEARCH IN NUCLEAR PHYSICS.
AD-629 210 FLD. 20/8

• • •

NEUTRON SPECTRA FROM MONOENERGETICPHOTONS OF BISMUTH.
AD-629 963 FLD. 20/8

•ILLINOIS UNIV URBANA DEPT OF PSYCHOLOGY

• • •

BINOCULAR RIVALRY: INDIVIDUAL DIFFERENCESIN ITS FUNCTIONAL RELATIONSHIP TO LUMINANCEAND INSTRUCTIONAL CONDITIONS.
AD-629 900 FLD. 5/10

• • •

A MODEL FOR THE GENERALIZABILITY OF TESTSCONSTRUCTED BY STRATIFIED SAMPLING.
AD-629 901 FLD. 5/10

• • •

TR-3
ROLE ASSIGNMENT AND ATTITUDINAL COMMITMENT AS FACTORS IN NEGOTIATION. (AFOSR-65-1557)
AD-629 387 FLD. 5/10

• • •

TR-4
SOCIAL MOTIVES AND DECISION-MAKINGBEHAVIOR IN INTERPERSONAL SITUATIONS. (AFOSR-65-1558)
AD-629 487 FLD. 5/10

•ILLINOIS UNIV URBANA DEPT OF THEORETICAL AND APPLIED MECHANICS

• • •

T/AM-279
A STUDY OF TURBULENT FLOW IN ROUGH PIPES.
AD-629 037 FLD. 20/4

•ILLINOIS UNIV URBANA ELECTRICAL ENGINEERING RESEARCH LAB

• • •

TR-5
A STUDY OF A FAMILY OF COMPLEX SYSTEMSIAN APPROACH TO THE INVESTIGATION OF ORGANISMSBEHAVIOR. (AFOSR-65-1713)
AD-629 869 FLD. 6/4

•ILLINOIS UNIV URBANA GROUP EFFECTIVENESS RESEARCH LAB

• • •

INTERACTION PROCESS AND TASK OUTCOME INEXPERIMENTALLY-CREATED NEGOTIATION GROUPS. (AFOSR-65-2174)
AD-629 588 FLD. 5/10

•IMAGE INSTRUMENTS INC NEWTON LOWER FALLS MASS.

• • •

DEVELOPMENT OF COOLING DEVICE INACCORDANCE WITH BUREAU OF SHIPS.
AD-629 140 FLD. 13/1

•IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)

• • •

TRANSITION-METAL CARBON CHEMISTRY. (ML-TDR-64-135)
AD-629 988 FLD. 7/2

•IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF BOTANY

• • •

PHOTOSYNTHETIC MECHANISMS UNDER SUB-OPTIMAL CONDITIONS. (AFOSR-65-2699)
AD-629 995 FLD. 6/1

•INFORMATION SYSTEMS LAB UNIV OF MICHIGAN ANN ARBOR

• • •

ISL-65-2
MONOTONE CONGRUENCE ALGORITHMS, (AFOSR-65-1796)
AD-629 046 FLD. 9/2

•INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA RESEARCH AND ENGINEERING SUPPORT DIV

• • •

IDA/HQ-65-4151
EXPLORATORY MEETING ON THE MAGNETICTAPE RECORDING OF SEISMIC DATA.
AD-629 199 FLD. 17/10

• • •

RP-P-210
EXPLORATORY MEETING ON THE MAGNETICTAPE RECORDING OF SEISMIC DATA.
AD-629 199 FLD. 17/10

•INSTITUTO NACIONAL DE TECHNICA AEROESPACIAL MADRID (SPAIN)

• • •

HETEROGENEOUS COMBUSTIONS AND FLAMESSTRUCTURES. (AFOSR-65-1791)
AD-629 015 FLD. 21/2

•INSTITUTO VENEZOLANO DE INVESTIGACIONES CIENTIFICAS CARACAS DEPARTAMENTO DE PATOLOGIA EXPERIMENTAL

• • •

CYTOCHEMISTRY AND BIOCHEMISTRY OF P.BRASILIENSIS.
AD-629 973 FLD. 6/1

•INTERNATIONAL RECTIFIER CORP LOS ANGELES CALIF

• • •

PRODUCTION ENGINEERING MEASURE. HIGHVOLTAGE SILICON RECTIFIER STACKS.
AD-629 929 FLD. 9/1

•ISOMET CORP PALISADES PARK N J

• • •

DESIGN OF A TEST MODEL FOR A SOLID ELECTROLYTECARBON DIOXIDE REDUCTION SYSTEM. (AMRL-TR-65-153)
AD-629 982 FLD. 6/11

•ITT ELECTRON TUBE DIV ROANOKE VA

• • •

3239A
PRODUCTION ENGINEERING MEASURE FOR TYPEFW-202 BARRIER GRID STORAGE TUBE.
AD-629 190 FLD. 9/1

•ITT KELLOG COMMUNICATIONS SYSTEMS CHICAGO ILL

• • •

INVESTIGATION OF FAULT DIAGNOSIS BY TRANSFERFUNCTION TECHNIQUES.

(APL-TR-65-113)
AD-625 987 FLD. 9/3

•JOHNS HOPKINS UNIV BALTIMORE MD
• • •
ON THE ZETA FUNCTION OF A HYPERSURFACE,
AD-625 477 FLD. 12/1

•JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MICROBIOLOGY
• • •
ANTIBODY-COMPLEMENT COMPLEXES,
AD-624 873 FLD. 6/13

•JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF STATISTICS
• • •
TR-39
THE SIGN TEST ON AUTOREGRESSIVE DATA.
AD-625 272 FLD. 12/1

•JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
• • •
TG-230-T453
CONTRIBUTION TO THE PROBLEM OF ESTIMATINGTHE LENGTH OF THE CHEMICAL REACTION ZONEBEHIND THE FRONT OF A DETONATION WAVE,
(TT-66-60094)
AD-625 974 FLD. 19/4
• • •
TG-230-T461
IMPROVEMENT OF METHODS FOR MEASURINGDETONATION RATES,
(TT-66-60097)
AD-625 605 FLD. 19/2

•KANSAS UNIV LAWRENCE DEPT OF PHYSICS AND ASTRONOMY
• • •
PARAMAGNETIC RESONANCE OF TRIVALENTFE57 IN DOUBLE NITRATE CRYSTALS,
AD-624 872 FLD. 7/4

•KIEL UNIV (WEST GERMANY) INSTITUT FUER EXPERIMENTELLE PHYSIK
• • •
NEW METHOD OF MEASURING TRANSITIONPROBABILITIES.
(AFML-TR-65-417)
AD-625 595 FLD. 7/4

•KORAD CORP SANTA MONICA CALIF
• • •
LASER-PUMPED LASER.
AD-625 338 FLD. 20/5

•KUMAMOTO UNIV (JAPAN) MEDICAL SCHOOL
• • •
BIOLOGICAL SIGNIFICANCE OF A PROTEASEINHIBITOR NEWLY ISOLATED FROM ANIMAL TISSUESIN INFLAMMATION.
(ARDG(FE)-J-196)
AD-624 889 FLD. 6/1

•LABORATOIRE DE PHYSIQUE THEORIQUE ET HAUTES ENERGIES ORSAY (FRANCE)
• • •
THE RICCATI EQUATION AND REGGE POLES,
(AFOSR-65-1756)
AD-625 355 FLD. 12/1

•LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
• • •
703
FREE VIBRATIONS OF THE EARTH AND THEPROPERTIES OF ITS DEEP INTERIOR REGIONS.PART I. DENSITY.
(AFCRL-65-792)
AD-625 308 FLD. 8/7

•LENKURT ELECTRIC CO INC SAN CARLOS CALIF
• • •
MULTIPLEXER SET AN/FCC-17( ) ANDMULTIPLEXER SET AN/MCC-12.
(RADC-TDR-63-440-V2)
AD-625 549 FLD. 9/5

•LEWIS (E B) CO INC EAST HARTFORD CONN
• • •
PRODUCTION ENGINEERING MEASURECRYSTAL UNIT CR-(XM-46A)/U.
AD-625 202 FLD. 9/1

•LIN (T Y) AND ASSOCIATES VAN NUYS CALIF.
• • •
64249
BLAST AND IMPACT EXPOSURE OF EXISTINGSTRUCTURAL FIRE PROTECTION SCHEMES.
AD-625 040 FLD. 13/12

•LINCOLN LAB MASS INST OF TECH LEXINGTON
• • •
TRANSFORMATION FROM A LINEAR MOMENTUM TOAN ANGULAR MOMENTUM BASIS FOR RELATIVISTICPARTICLES OF NONZERO MASS AND ANY SPIN,
AD-624 865 FLD. 20/10
• • •
SOME RESULTS ON THE STOCHASTIC SIGNALPARAMETER ESTIMATION PROBLEM.
AD-624 866 FLD. 9/4
• • •
GRAPHICS.
(ESD-TDR-65-561)
AD-625 567 FLD. 5/8
• • •
JA-2325A
LATERAL-FEED DISPLACEMENT IN APARABOLOID.
(ESD-TDR-65-552)
AD-625 018 FLD. 9/1
• • •
JA-2411
THE SCALING OF DIGITAL DIFFERENTIALANALYZERS.
(ESD-TDR-65-596)
AD-625 021 FLD. 9/2
• • •
JA-2493
ON SURFACE-WAVE COUPLING BETWEENELEMENTS OF LARGE ARRAYS.
(ESD-TDR-65-488)
AD-625 016 FLD. 9/5
• • •
JA-2590
SPIN-ORBIT INTERACTION IN GRAPHITE,
(ESD-TDR-65-550)
AD-625 017 FLD. 20/12
• • •
JA-2590
SIMPLE APPARATUS FOR APPLYING UNIAXIALPRESSURE AT VERY LOW TEMPERATURES,
(ESD-TDR-65-502)
AD-625 020 FLD. 14/2
• • •
TN-1965-15
A SHAPED REFLECTOR AS A PRIMARY FEED FORHAYSTACK.
(ESD-TDR-65-457)
AD-625 275 FLD. 9/5
• • •
TR-394
TELEMETRY ANTENNA FOR LINCOLN EXPERIMENTALSATELLITES LES-1 AND LES-2.
(ESD-TDR-65-239)
AD-624 936 FLD. 9/6

•LITTLE (ARTHUR D) INC CAMBRIDGE MASS
• • •
STUDY AND DEVELOPMENT OF MATERIALS ANDTECHNIQUES FOR PASSIVE THERMAL CONTROL OFFLEXIBLE EXTRAVEHICULAR SPACE GARMENTS.
(AMRL-TR-65-156)
AD-624 886 FLD. 6/11
• • •
4030965
INTERNAL WAVES BIBLIOGRAPHY.
AD-625 237 FLD. 8/10

•LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF
• • •
FE54(N,P), (N, ALPHA), AND (N,2N) CROSS SECTIONS,
AD-624 980 FLD. 20/8

•LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
• • •
AMPLIFICATION OF MAGNETOELASTIC WAVES INYTTRIUM IRON GARNET AT 300K,
AD-624 981 FLD. 20/12
• • •
AN OPTIMAL DISCRETE CONTROL STRATEGY FORINTER-PLANETARY GUIDANCE.
AD-624 982 FLD. 22/3
• • •
ELECTRON-ION RECOMBINATION IN NITRICOXIDE IN THE TEMPERATURE RANGE 196 TO 358K,
AD-625 110 FLD. 7/4

•LOUISIANA STATE UNIV BATON ROUGE
• • •
EFFECT OF A CYLINDRICAL BOUNDARY ON THEADDED MASS OF TWO CYLINDERS IN LIQUID HELIUM,
(AROD-4016:5)
AD-625 696 FLD. 20/4

•LOYOLA UNIV CHICAGO ILL DEPT OF PHYSIOLOGY
• • •
MYOCARDIAL CATECHOLAMINES AND STIMULATIONOF THE STELLATE GANGLION IN HEMORRHAGICSHOCK,
AD-625 279 FLD. 6/5

•LTV VOUGHT AERONAUTICS DIV LING-TEMCO-VOUGHT INC DALLAS TEX
• • •
2-53470/3R459
METHOD FOR ESTIMATING THE CATAPULTPERFORMANCE OF A CARRIER-BASED AIRPLANE.
AD-624 930 FLD. 1/3

•LYON UNIV (FRANCE) LABORATOIRE DE PATHOLOGIE EXPERIMENTALE
• • •
L'ACTIVITE ELECTRIQUE PHASIQUE DU CORTEX ETDU THALAMUS AU COURS DU SOMMEIL DESYNCHRONISE CHEZ LE CHAT (PHASIC ELECTRICAL ACTIVITY OF THECORTEX AND OF THE THALAMUS DURING DESYNCHRONIZED SLEEPOF THE CAT),
(AFOSR-65-2252)
AD-625 342 FLD. 6/16

•MALLORY (P R) AND CO INC INDIANAPOLIS IND
• • •
PRODUCTION ENGINEERING MEASURE FOR IMPROVEDRELIABILITY OF SOLID ELECTROLYTE TANTALUMCAPACITORS.
AD-625 584 FLD. 9/1

•MANITOBA UNIV WINNIPEG
• • •
AUDITORY SENSITIVITY AFTER PROLONGEDVISUAL DEPRIVATION,
AD-625 928 FLD. 6/16

•MARTIN CO BALTIMORE MD
• • •
ER-13950
ORBIT DETERMINATION AND ANALYSIS BY THEMINIMUM VARIANCE METHOD.
(AFCRL-65-579)
AD-625 493 FLD. 22/3
• • •
SCIENTIFIC-1

ORBIT DETERMINATION AND ANALYSIS BY THEMINIMUM VARIANCE METHOD.
(AFCRL-65-979)
AD-625 953 FLD. 22/3

•MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
• • •
PROOF THAT SCATTERING IMPLIES PRODUCTION INQUANTUM FIELD THEORY,
(AFOSR-65-1817)
AD-625 969 FLD. 20/8
• • •
QUANTUM MECHANICS OF A MANY-BOSON SYSTEMAND THE REPRESENTATION OF CANONICALVARIABLES,
(AFOSR-65-1776)
AD-625 971 FLD. 20/10
• • •
SELECTION RULES FOR PARAFIELDS AND THEABSENCE OF PARA PARTICLES IN NATURE.
(AFOSR-65-1818)
AD-625 972 FLD. 20/10

•MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
• • •
INDEX CATALOGUE TO RUSSIAN, CENTRAL ANDEASTERN EUROPEAN, AND CHINESE LITERATURE INMEDICAL ENTOMOLOGY. VOLUME 9. VIRAL DISEASES,
AD-625 100 FLD. 6/3
• • •
CURRENT REFERENCES IN MEDICAL ENTOMOLOGYFROM RUSSIAN, CENTRAL AND EASTERN EUROPEANAND CHINESE LITERATURE, VOLUME 9, NO. 12,
AD-625 274 FLD. 6/3

•MARYLAND UNIV COLLEGE PARK INST FOR FLUID DYNAMICS AND APPLIED MATHEMATICS
• • •
BN-411
NONLINEAR MECHANICS OF UNIVERSAL PLASMAINSTABILITIES.
AD-625 033 FLD. 20/9

•MASSACHUSETTS INST OF TECH CAMBRIDGE
• • •
MAGNETIC PROPERTIES OF INAS DIODEELECTROLUMINESCENCE,
AD-624 878 FLD. 20/3
• • •
MAC-TR-21
QUEUEING MODELS FOR FILE MEMORY OPERATION.
AD-624 993 FLD. 9/2

•MASSACHUSETTS INST OF TECH CAMBRIDGE AEROELASTIC AND STRUCTURES RESEARCH LAB
• • •
ASRL-TR-134-1
THEORETICAL CONSIDERATIONS OF PANEL FLUTTERAT HIGH SUPERSONIC MACH NUMBERS,
(AFOSR-65-1907)
AD-624 995 FLD. 20/11

•MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY
• • •
THE CRYSTAL AND MOLECULAR STRUCTURE OFPENTAKIS(METHYLISONITRILE)COBALT(I) PERCHLORATE,
(AROD-3616:9)
AD-625 639 FLD. 7/4
• • •
CRYSTAL STRUCTURE OF TETRAMERIC COBALT(II)ACETYLACETONATE,
(AROD-3616:8)
AD-625 643 FLD. 7/4
• • •
INFRARED SPECTRA (1000-200/CM) OF SOMETRANSITION-METAL COMPLEXES WITH TERTIARYARSINE OXIDES,
(AROD-3616:7)
AD-625 646 FLD. 7/4
• • •
DSR-8841
ION FRACTIONATION IN DROPS FROM BREAKINGBUBBLES.
AD-625 179 FLD. 7/4

•MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF GEOLOGY AND GEOPHYSICS
• • •
GEOCHEMISTRY OF IODINE, BROMINE, ANDCHLORIDE IN THE AIR-SEA-SEDIMENT SYSTEM,
AD-625 314 FLD. 8/5
• • •
RARE EARTH DISTRIBUTIONS IN THE MARINEENVIRONMENT.
AD-625 347 FLD. 8/5

•MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
• • •
INVESTIGATION OF SOLIDIFICATION OF HIGHSTRENGTH STEEL CASTINGS.
(AMRA-CR64-04/3)
AD-624 987 FLD. 11/6

•MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF NUTRITION AND FOOD SCIENCE
• • •
DEFINITION AND OBJECTIVES OF THE CONFERENCEON PHOSPHATES AND DENTAL CARIES,
AD-625 926 FLD. 6/9

•MASSACHUSETTS INST OF TECH CAMBRIDGE ENGINEERING PROJECTS LAB
• • •
DSR-9393-1
BASIC APPLIED RESEARCH IN FLUID POWER CONTROL.
(AFFDL-TR-65-79)
AD-624 885 FLD. 13/7

•MASSACHUSETTS INST OF TECH CAMBRIDGE INSTRUMENTATION LAB
• • •
E-1866
INERTIAL INSTRUMENT DESIGN VERIFICATIONTESTS FOR HIGH-G APPLICATIONS,
AD-625 042 FLD. 17/7

•MATERIALS ADVISORY BOARD NAS-NRC WASHINGTON D C
• • •
MAB-206-M(3)
METALWORKING PROCESSES AND EQUIPMENT.
AD-625 049 FLD. 13/8
• • •
MAB-216-M SUPERSEDED
EVALUATION TEST METHODS FOR REFRACTORYMETAL SHEET MATERIALS.
AD-625 606 FLD. 14/2

•MCDONNELL AIRCRAFT CORP ST LOUIS MO
• • •
ACRONYMS,
AD-625 208 FLD. 5/2

•MCGILL UNIV MONTREAL (QUEBEC)
• • •
THE MANIPULATION OF STRATEGIES OF REPORT INDICHOTIC LISTENING,
AD-625 106 FLD. 5/10
• • •
SPATIAL ORGANIZATION OF CHILDREN'SRESPONSES TO A PICTORIAL DISPLAY,
AD-625 107 FLD. 5/10

•MCGILL UNIV MONTREAL (QUEBEC) DEPT OF GEOGRAPHY
• • •
DIRECTORY OF INSTITUTIONS PRIMARILY DEVOTEDTO HUMID TROPICS RESEARCH,
AD-625 927 FLD. 8/6

•MECHANICAL TECHNOLOGY INC LATHAM N Y
• • •
MTI-69TR37
EXPERIMENTS ON ULTRA-STABLE GASJOURNAL BEARINGS.
AD-625 923 FLD. 13/9

•MELPAR INC FALLS CHURCH VA
• • •
FRACTURE OF GYPSUM PLASTERS AND CEMENTMORTARS BY DYNAMIC LOADING.
(WL-TR-65-190)
AD-625 958 FLD. 11/2

•MICHIGAN STATE UNIV EAST LANSING DEPT OF STATISTICS
• • •
JG-8
ON THE GENERAL STOCHASTIC EPIDEMIC,
AD-624 899 FLD. 12/1
• • •
JG-9
ON THE INDEPENDENCE OF YEARLY WATER INPUTSIN DAMS.
AD-624 898 FLD. 8/8
• • •
MSU-RM-147
ON THE INDEPENDENCE OF YEARLY WATER INPUTSIN DAMS.
AD-624 898 FLD. 8/8
• • •
RM-199
ON THE GENERAL STOCHASTIC EPIDEMIC,
AD-624 899 FLD. 12/1

•MICHIGAN UNIV ANN ARBOR
• • •
SEEKING INFORMATION TO REDUCE THE RISK OFDECISIONS,
(AFOSR-65-2203)
AD-625 942 FLD. 5/10

•MICHIGAN UNIV ANN ARBOR DEPT OF ASTRONOMY
• • •
BASIC SOLAR RESEARCH.
AD-625 026 FLD. 3/2

•MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB
• • •
05361-12-S
RESEARCH ON CROSSED-FIELD ELECTRONDEVICES.
AD-625 938 FLD. 9/1

•MICROWAVE LAB STANFORD UNIV CALIF
• • •
ML-1393
RESEARCH ON SELECTED MICROWAVE PROPERTIESOF FERRITES.
(AFCRL-65-668)
AD-625 315 FLD. 20/1

•MIDWEST RESEARCH INST KANSAS CITY MO
• • •
OBJECTIVE TESTS FOR USE IN THE TECHNOLOGYOF COMPRESSED FOODS.
AD-624 869 FLD. 6/8

•MINNESOTA UNIV DULUTH
• • •
OCTOBER 1965 STATUS REPORT,
AD-625 029 FLD. 7/4

•MINNESOTA UNIV MINNEAPOLIS
• • •
OXIDATIVE STUDIES OF POLYPHENOLS.
(AROD-3193:1)
AD-624 879 FLD. 7/3
• • •
THE METHOD OF WEIGHTED RESIDUALS AND ITSRELATION TO CERTAIN VARIATIONAL PRINCIPLESFOR THE ANALYSIS OF TRANSPORT PROCESSES,
(AFOSR-65-2208)
AD-625 951 FLD. 9/1

•MINNESOTA UNIV MINNEAPOLIS DEPT OF CHEMISTRY
• • •
POINT DEFECTS IN MAGNESIUM OXIDE,
(AFOSR-69-1762)
AD-629 550 FLD. 20/12

•MINNESOTA UNIV MINNEAPOLIS DIV OF PHYSICAL CHEMISTRY
• • •
NUCLEAR MAGNETISM,
(AFOSR-69-1761)
AD-629 548 FLD. 20/8

•MITRE CORP BEDFORD MASS
• • •
TM-03728
A COMPUTERIZED TECHNIQUE TO EXPRESSUNCERTAINTY IN ADVANCED SYSTEM COST ESTIMATES,
(ESD-TR-69-79)
AD-629 899 FLD. 5/3
• • •
TM-04063
SYSTEM COST ANALYSIS: A MANAGEMENT TOOL FORDECISION MAKING,
(ESD-TR-69-405)
AD-629 893 FLD. 5/3

•MONSANTO RESEARCH CORP DAYTON OHIO
• • •
STUDIES OF LOW-TEMPERATURE OXIDATIONREACTIONS.
AD-629 307 FLD. 7/2

•MORLEY CHEMICAL LAB WESTERN RESERVE UNIV CLEVELAND OHIO
• • •
THE DECOMPOSITION OF SILYL HYDROPEROXIDES,
(AROD-3392:8)
AD-629 648 FLD. 7/3
• • •
THE SYNTHESIS AND PROPERTIES OF TINHYDROPEROXIDES,
(AROD-3392:6)
AD-629 649 FLD. 7/3
• • •
THE SYNTHESIS AND REACTIONS OF BISDIPHENYLPHOSPHINIC PEROXIDE,
(AROD-3392:4)
AD-629 650 FLD. 7/3

•MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
• • •
PRODUCTION ENGINEERING MEASURE FOR SILICONOVERLAY TRANSISTORS.
AD-629 317 FLD. 9/1

•NATIONAL BUREAU OF STANDARDS WASHINGTON D C
• • •
HEAT CAPACITY AND THERMODYNAMICPROPERTIES OF BERYLLIUM ALUMINATE(CHRYSOBERYL), BEO-A1203, FROM 16 TO 280K,
(AFOSR-69-1786)
AD-629 096 FLD. 20/13
• • •
PATHS, TREES, AND FLOWERS,
(AROD-3932:1)
AD-629 903 FLD. 12/2
• • •
ON THE SURFACE DUALITY OF LINEAR GRAPHS,
(AROD-3932:3)
AD-629 904 FLD. 12/2
• • •
MINIMUM PARTITION OF A MATROID INTOINDEPENDENT SUBSETS,
(AROD-3932:5)
AD-629 905 FLD. 12/2
• • •
LEHMAN'S SWITCHING GAME AND A THEOREM OFTUTTE AND NASH-WILLIAMS,
(AROD-3932:6)
AD-629 906 FLD. 12/2
• • •
MAXIMUM MATCHING AND A POLYHEDRON WITHO,1-VERTICES,
(AROD-3932:9)
AD-629 907 FLD. 12/2
• • •
NBS-8962
HEATS OF FORMATION OF METALLIC BORIDESBY FLUORINE BOMB CALORIMETRY.
(AFAPL-TR-69-110)
AD-629 336 FLD. 7/4

•NATIONAL OPINION RESEARCH CENTER NEW YORK
• • •
101-PT-2
COMMUNITY REACTIONS TO SONIC BOOMS IN THEOKLAHOMA CITY AREA. VOLUME II. DATA ONCOMMUNITY REACTIONS AND INTERPRETATIONS.
(AMRL-TR-69-37-VOL-2)
AD-628 332 FLD. 1/3

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
• • •
NRC-7880
APPARATUS FOR MEASUREMENT OF THELUMINESCENCE SPECTRA OF CRYSTALS ATN.R.C. OTTAWA,
AD-629 954 FLD. 14/2
• • •
NRC-8591
BIOSYNTHESIS OF PULCHERRIMINIC ACID,
AD-629 960 FLD. 6/1
• • •
NRC-8561
AN APPROACH TO THE PROBLEM OF IONICDISTRIBUTION IN LIQUID SILICATES,
AD-629 962 FLD. 7/4
• • •
NRC-8619
ABSORPTION SPECTRUM OF THE CCN RADICAL,
AD-629 968 FLD. 7/4
• • •
NRC-8649
DEVELOPMENTS IN ANALYTICAL CHEMISTRY ATNRC,
AD-629 979 FLD. 7/2

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
• • •
NRC-8374
PERIODICALLY ADJUSTED FEEDBACK CONTROLSMULTIPLIER PHOTOTUBE,
AD-629 959 FLD. 9/5
• • •
NRC-8809
A TRANSISTORIZED CATHODE-RAY PHASE-SENSITIVENULL DETECTOR,
AD-629 957 FLD. 9/3
• • •
NRC-8518
2,700 MC./S. SOLAR PATROL AT THE DOMINIONRADIO ASTROPHYSICAL OBSERVATORY, PENTICTON,B.C.
AD-629 958 FLD. 3/2
• • •
NRC-8930
A STUDY OF THERMAL TRANSPIRATION USINGULTRAHIGH VACUUM TECHNIQUES,
AD-629 959 FLD. 20/13
• • •
NRC-8638
A NEW METHOD FOR FINDING HETEROGENEOUSENERGY DISTRIBUTIONS FROM PHYSICALADSORPTION ISOTHERMS,
AD-629 972 FLD. 7/4
• • •
NRC-8639
ANALYSIS OF PHYSICAL ADSORPTION ISOTHERMSON HETEROGENEOUS SURFACES AT VERY LOWPRESSURES,
AD-629 973 FLD. 7/4

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
• • •
NRC-8571
THE KINETICS OF THE INHIBITED AUTOXIDATIONOF TETRALIN. II,
AD-629 963 FLD. 7/4
• • •
NRC-8591
ABSOLUTE RATE CONSTANTS FOR HYDROCARBONAUTOXIDATION. II. DEUTERO STYRENES AND RINGSUBSTITUTED STYRENES,
AD-629 969 FLD. 7/4
• • •
NRC-8598
EXCHANGE REACTIONS IN THE SYSTEM BORONTRIFLUORIDEMETHANOL,
AD-629 965 FLD. 7/4
• • •
NRC-8609
CHARACTERISTICS OF POROUS CELLULOSE ACETATEMEMBRANES FOR THE SEPARATION OF SOMEORGANIC SUBSTANCES IN AQUEOUS SOLUTION,
AD-629 966 FLD. 7/4
• • •
NRC-8611
THE ARSENIDES OF TUNGSTEN AND MOLYBDENUM,
AD-629 967 FLD. 11/6
• • •
NRC-8621
THERMAL DEPOLYMERIZATION OF POLYMETHYLMETHACRYIATE AND POLY-ALPHA-METHYLSTYRENEIN SOLUTION IN VARIOUS SOLVENTS,
AD-629 969 FLD. 7/4
• • •
NRC-8633
EXCITED OXYGEN ATOMS IN THE PHOTOLYSIS OFN2O AND NO2,
AD-629 971 FLD. 8/1
• • •
NRC-8641
ENTROPY CHANGES AT THE PHASE TRANSITIONSIN ICE,
AD-629 974 FLD. 7/4
• • •
NRC-8718
TACTICITY DETERMINATIONS ON ALLYLMETHACRYLATE POLYMERS.
AD-629 977 FLD. 11/9

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED PHYSICS
• • •
NRC-8696
ATOMIC TRANSITION SETS CANADA'S TIME,
AD-629 976 FLD. 14/2

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
• • •
NRC-8498
SEASONAL ACCLIMATIZATION IN VARYING HARE(LEPUS AMERICANUS),
AD-629 956 FLD. 6/3

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE CHEMISTRY
• • •
NRC-8591
ON THE LINEAR DIELECTRIC PROPERTIES OFFINITE IONIC CRYSTALS,
AD-629 961 FLD. 20/2

•NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
• • •
NRC-8629
THE EFFECT OF PRESSURE AND TEMPERATUREON THE ELECTRICAL RESISTANCE OF RUBIDIUM ANDCAESIUM.
AD-629 970 FLD. 11/6

•NAVAL AIR DEVELOPMENT CENTER

JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT

• • •

RESPONSE DURATION AND INTERRESPONSE TIMEUNDER FR5 AND VR5 SCHEDULES AND SUBSEQUENTEXTINCTION,
AD-625 329 FLD. 5/10

• • •

NADC-MR-6501
CINERADIOGRAPHIC OBSERVATIONS OF HUMANSUBJECTS DURING TRANSVERSE ACCELERATIONSOF +5GX AND +10GX.
AD-625 254 FLD. 6/19

•NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERO-ELECTRONIC TECHNOLOGY DEPT

• • •

NADC-AE-6517
A FORCE BALANCE ANALOG FOR DETERMININGCHARACTERISTICS OF OCEAN CABLE SYSTEMS.
AD-625 530 FLD. 13/10

•NAVAL AMMUNITION DEPOT CRANE IND

• • •

RDTR-66
THE PRODUCTION OF VISIBLE LIGHT BY THETHORIA-CERIA MANTLE: PHYSICAL CHARACTERISTICSAND A PROPOSED THEORY OF THE OCCURINGMECHANISMS AND PROCESSES,
AD-625 008 FLD. 7/4

•NAVAL APPLIED SCIENCE LAB BROOKLYN N Y

• • •

6377-5
STRESS CRACKING PROPERTIES OF TI-721 ALLOYTITANIUM LARGE SCALE BUTT WELDED AND BASEPLATE SPECIMENS IN AIR AND SEA WATER.
AD-625 532 FLD. 11/6

• • •

PR-1
STRESS CRACKING PROPERTIES OF TI-721 ALLOYTITANIUM LARGE SCALE BUTT WELDED AND BASEPLATE SPECIMENS IN AIR AND SEA WATER.
AD-625 532 FLD. 11/6

•NAVAL BOILER AND TURBINE LAB PHILADELPHIA PA

• • •

INSTRUMENT STANDARDS.
AD-624 923 FLD. 14/2

•NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

• • •

TN-N-727
ICE CONSTRUCTION-PROTOTYPE SUBMERSIBLEELECTRIC PUMP AND EXTENSION TUBE.
AD-625 320 FLD. 13/11

• • •

TN-N-752
LOCOMOTION OF OCEAN BOTTOM VEHICLE BYSHIFTING BALLAST.
AD-625 321 FLD. 13/10

• • •

TN-N-775
AN IMPROVED STEPWISE REGRESSION ANALYSISPROCEDURE.
AD-625 328 FLD. 12/1

• • •

TN-N-783
COLLECTIVE PROTECTOR DESIGN AND DEVELOPMENT.
AD-625 402 FLD. 13/13

• • •

TR-913
IMPROVED HEAT TRANSFER IN MULTISTAGE FLASHEVAPORATION.
AD-625 267 FLD. 20/13

•NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN) DEPT OF BIOCHEMISTRY

• • •

HAEMOGLOBIN E IN VIETNAMESE.
AD-625 111 FLD. 6/5

• • •

HAEMOGLOBIN J AND E IN A THIA KINDRED.
(NAVMED-MR005.09-1601.7.8)
AD-625 459 FLD. 6/5

•NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C

• • •

TRANS-296
SECTOR RADIO-RANGE BEACONS WITH RADIATINGEQUISIGNAL ZONES,
(TT-65-64823)
AD-624 916 FLD. 17/7

•NAVAL ORDNANCE LAB CORONA CALIF

• • •

THE ELASTIC SCATTERING OF LOW ENERGYELECTRONS FROM ATOMIC HELIUM.
(NAVWEPS-8824)
AD-625 519 FLD. 20/8

•NAVAL ORDNANCE LAB WHITE OAK MD

• • •

NOLTR-65-95
SYNTHETIC NERVE NETWORKS.
AD-625 225 FLD. 6/4

•NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF

• • •

NOTS-TP-3659
GAAS INJECTION LASER INVESTIGATION.
AD-624 935 FLD. 20/5

• • •

NOTS-TP-3959
HIGH-PRESSURE GAS FROM LITHIUM HYDRIDE ANDSEA WATER,
(NAVWEPS-8990)
AD-625 513 FLD. 19/8

• • •

NOTS-TP-3978
DIFFUSION AND CONDUCTIVITY OF PLASMAS INSTRONG EXTERNAL FIELDS,
(NAVWEPS-9003)
AD-624 998 FLD. 20/9

• • •

NOTS-TP-3989
USE OF AN EVAPORATED DIELECTRIC FILM FORDETERMINING THE OPTICAL CONSTANTS OF AMETAL. I AND II.
(NAVWEPS-9010)
AD-624 999 FLD. 20/6

•NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF

• • •

STB-66-15
THE VALIDITY OF THE ADVANCED TECHNICANSTEST IN PREDICTING PERFORMANCE AT CLASS 'B'AND 'C' SCHOOLS.
AD-625 119 FLD. 5/9

•NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF

• • •

USNRDL-TR-930
THE SEQUENCE OF EVENTS IN RADIATIONCARCINOGENESIS: A UNIFYING FORMULATION.
(NAVMED-MR005.08-1200-2)
AD-624 917 FLD. 6/18

•NAVAL RESEARCH LAB WASHINGTON D C

• • •

NRL-6333
RADIATION DAMAGE IN SILICON SOLAR CELLS FROM4.6-MEV PROTON BOMBARDMENT.
AD-625 440 FLD. 10/2

• • •

NRL-6337
THE DAMPING OF CAPILLARY WAVES AT THE AIR/WATER INTERFACE BY NATURALLY OCCURRINGSURFACE-ACTIVE MATERIAL.
AD-624 933 FLD. 20/4

• • •

NRL-6341
ATMOSPHERIC RADIOACTIVITY IN ANTARCTICA1956-1963.
AD-625 439 FLD. 4/1

• • •

NRL-6369
METALLURGICAL CHARACTERISTICS OF HIGHSTRENGTH STRUCTURAL MATERIALS.
AD-625 374 FLD. 11/6

•NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

• • •

VISUAL LOCALIZATION OF THE HORIZONTAL ASA FUNCTION OF BODY TILT UP TO = 90 DEGREESFROM GRAVITATIONAL VERTICAL,
AD-625 266 FLD. 6/19

• • •

OTOLITH ORGAN ACTIVITY WITHIN EARTHSTANDARD, ONE-HALF STANDARD, AND ZERO GRAVITYENVIRONMENTS.
(NAVMED-MR005-13-6001-119)
AD-625 323 FLD. 6/19

•NAVAL SUBMARINE MEDICAL CENTER GROTON CONN

• • •

LIGHTING SURVEY OF U.S.S. DOGFISH (SS350).
AD-625 259 FLD. 13/10

•NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y

• • •

NAVTRADEVCEN-IH-11
PERCEPTUAL VERTIGO: A DIMENSIONAL STUDY.
AD-625 925 FLD. 6/19

• • •

NAVTRADEVCEN-IH-24
BIOPOTENTIAL SIGNALS AS A FUNCTION OFLEARNING TASK DIFFICULTY.
AD-625 130 FLD. 5/10

•NAVY ELECTRONICS LAB SAN DIEGO CALIF

• • •

NEL-1314
SPEECH INTERFERENCE ASPECTS OF NAVYNOISES. CALCULATIONS SHOW SPEECH INTERFERENCE MEASUREMENTS ARE SIMPLIFIED BYAVERAGING SOUND PRESSURE LEVELS IN MIDFREQUENCY OCTAVES.
AD-625 262 FLD. 5/5

•NEW YORK STATE AGRICULTURAL EXPERIMENT STATION GENEVA

• • •

A STUDY OF THE RADIATION-INDUCED SOFTENINGOF PLANT TISSUES.
AD-625 983 FLD. 6/8

•NEW YORK UNIV N Y

• • •

AN APPROXIMATE SOLUTION OF THE CROCCOEQUATION,
(ARL-65-210)
AD-625 206 FLD. 12/1

• • •

ON THE INITIAL CONDITIONS FOR BOUNDARYLAYER EQUATIONS,
(ARL-65-208)
AD-625 207 FLD. 20/4

•NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH

• • •

SCIENTIFIC-21
MICROELECTRONIC AMPLIFIERS HAVING MINIMUMSENSITIVITY TO ARBITRARY PARAMETER CHANGES,
(AFCRL-65-802)
AD-625 379 FLD. 9/1

• • •

SCIENTIFIC-22
STEADY-STATE AND TRANSIENT RESPONSE OFARBITRARY TAPERED DISTRIBUTED RC NETWORKSWITH LUMPED

LOAD TERMINATIONS.
(AFCRL-69-803)
AD-625 392 FLD. 9/5

• • •

TR-900-119
MICROELECTRONIC AMPLIFIERS HAVING MINIMUMSENSITIVITY TO ARBITRARY PARAMETER CHANGES,
(AFCRL-69-802)
AD-625 379 FLD. 9/1

• • •

TR-900-120
STEADY-STATE AND TRANSIENT RESPONSE OFARBITRARY TAPERED DISTRIBUTED RC NETWORKSWITH LUMPED LOAD TERMINATIONS.
(AFCRL-69-803)
AD-625 392 FLD. 9/5

•NORTH CAROLINA STATE UNIV RALEIGH DEPT OF ENGINEERING RESEARCH

• • •

TERNARY INTERSTITIAL COMPOUNDS OF BORONAND NITROGEN WITH TRANSITION AND POSTTRANSITION METALS.
(AROD-3138:18)
AD-625 028 FLD. 11/6

•NORTHWESTERN UNIV EVANSTON ILL DEPT OF CHEMISTRY

• • •

ANALYSIS OF RELAXATION PROCESSES IN AMULTILEVEL SYSTEM. A MANY-SHOT EXPANSIONTECHNIQUE,
(AFOSR-69-1671)
AD-625 602 FLD. 7/4

•NORTHWESTERN UNIV EVANSTON ILL DEPT OF ELECTRICAL ENGINEERING

• • •

A NOTE ON THE RELIABILITY OF COMMUNICATIONNETWORKS.
(AROD-3298:22)
AD-625 652 FLD. 14/4

•NORTRONICS NEWBURY PARK CALIF APPLIED RESEARCH DEPT

• • •

NVR-2920
STUDY FOR GENERALIZED MODEL FOR SEMICONDUCTOR RADIATION RESPONSE PREDICTION.
(ECOM-00423-2)
AD-625 341 FLD. 18/8

•OFFICE OF AEROSPACE RESEARCH WASHINGTON D C

• • •

OAR69-10
AVAILABILITY OF SCIENTIFIC JOURNALS INDEFENSE ORIENTED LIBRARIES,
AD-625 509 FLD. 5/2

• • •

OAR-69-13
TOWARD A NATIONAL TECHNICAL INFORMATIONSYSTEM,
AD-625 496 FLD. 5/2

•OFFICE OF NAVAL RESEARCH WASHINGTON D C

• • •

ONR-22-VOL-1
CONFERENCE ON THE NAVY MICROELECTRONICSPROGRAM (3RD), AT THE U.S. NAVAL POSTGRADUATESCHOOL, MONTEREY, CALIFORNIA, APRIL 5, 6, 7, 1965.
AD-625 007 FLD. 9/1

•OHIO STATE UNIV COLUMBUS DEPT OF SPEECH

• • •

COMMUNICATION BY VOICE,
AD-624 861 FLD. 17/2.1

•OHIO STATE UNIV COLUMBUS ROCKET RESEARCH LAB

• • •

FORMATION OF DETONATION WAVES INCOMBUSTIBLE GASEOUS MIXTURES.
(AFOSR-69-2209)
AD-625 489 FLD. 19/4

•OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

• • •

THE PHOTOCHEMICAL SYNTHESIS OF POLYAZACYCLOBUTANE SYSTEMS.
(AROD-3691:1)
AD-625 218 FLD. 7/3

•OKLAHOMA CITY AMA TINKER AFB OKLA DIRECTORATE OF MATERIEL MANAGEMENT

• • •

OCME-MN-69-1
IMPLEMENTATION OF RECURSIVE PROCEDURES ONTHE IBM 7080 COMPUTER USING THE 7098 FORTRANPROCESSOR.
AD-625 322 FLD. 12/1

•OKLAHOMA UNIV NORMAN SCHOOL OF AEROSPACE AND MECHANICAL ENGINEERING

• • •

RADIATIVE HEAT TRANSFER BETWEEN PARALLELPLATES SEPARATED BY A NON-ISOTHERMALMEDIUM ANISOTROPIC SCATTERING.
(ARL-69-211)
AD-625 209 FLD. 20/13

•OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY

• • •

ORC-69-23
PRIMAL-DUAL DECOMPOSITION PROGRAMMING.
AD-625 369 FLD. 12/2

•OSLO UNIV (NORWAY)

• • •

A FORTRAN PROGRAMME FOR THE ANALYSIS OFHYPERFRAGMENTS AND FOR OTHER EMULSIONSTUDIES,
(CERN-69-6)
AD-625 014 FLD. 18/8

•PACIFIC MISSILE RANGE POINT MUGU CALIF

• • •

PMR-TM-69-2
PERFORMANCE OF THE AN/GMD-2 RADIN SETIN THE DENPRO SYSTEM.
AD-625 118 FLD. 14/2

•PARKE MATHEMATICAL LABS INC CARLISLE MASS

• • •

SCIENTIFIC-2
THE ALGEBRA OF BLOCK DIAGRAMS,
(AFCRL-69-809)
AD-625 081 FLD. 12/1

•PENNSYLVANIA HOSPITAL PHILADELPHIA DEPT OF MOLECULAR BIOLOGY

• • •

THE MEMBRANE THEORY AND OTHER VIEWS FORSOLUTE PERMEABILITY, DISTRIBUTION, ANDTRANSPORT IN LIVING CELLS,
AD-624 871 FLD. 6/3

•PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF FUEL TECHNOLOGY

• • •

DETERMINATION OF THE DECOMPOSITION KINETICSOF HYDRAZINE USING A SINGLE-PULSE SHOCK TUBE,
(AROD-4047:1)
AD-625 178 FLD. 7/4

•PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF METEOROLOGY

• • •

OBJECTIVE CROSS-SECTION ANALYSIS.
(AFCRL-69-1005-P2)
AD-625 137 FLD. 4/1

• • •

INITIALIZATION OF PRIMITIVE-EQUATION MODELSFOR NUMERICAL WEATHER PREDICTION.
(AFCRL-69-1005-PT-1)
AD-625 348 FLD. 4/2

•PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB

• • •

SCIENTIFIC-259
A METHOD OF SOLVING THE INTEGRAL EQUATIONSFOR THE ERTICAL PROPAGATION OF TIME-HARMONICELECTROMAGNETIC PLANE WAVES IN ANISOTROPICVERTICALLY-HOMOGENEOUS MEDIA,
(AFCRL-69-872)
AD-625 609 FLD. 20/14

•PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS RESEARCH LAB

• • •

TR-22
PHASE EQUILIBRIUM STUDIES OF GERMANIUM ANDSILICON AT HIGH PRESSURES.
AD-625 928 FLD. 20/12

•PENNSYLVANIA UNIV PHILADELPHIA DEPT OF BIOLOGY

• • •

LIGHT EFFECTS ON OXYGEN EVOLUTION ANDPHOSPHORYLATION IN SPINACH CHLOROPLASTS,
AD-625 097 FLD. 6/3

•PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY

• • •

FLASH BLINDNESS,
AD-625 281 FLD. 6/5

• • •

LUMINANCE, PURITY AND WAVELENGTH MATCHES OFCONTRAST COLORS,
AD-625 282 FLD. 6/16

•PICATINNY ARSENAL DOVER N J AMMUNITION ENGINEERING DIRECTORATE

• • •

TM-1797
COMPARISON OF SKIP LOT AND GRAND LOTBALLISTIC TESTING BY USE OF COMPUTERSIMULATION.
AD-625 658 FLD. 19/1

• • •

TM-1767
VALUE RESPONSIBILITY OF THE DESIGNER.
AD-625 659 FLD. 19/1

•PITMAN-DUNN RESEARCH LABS FRANKFORD ARSENAL PHILADELPHIA PA

• • •

R-1779
FERROELECTRICS: THEIR ELECTRICAL BEHAVIORDURING, AND SUBSEQUENT TO, IONIZINGRADIATIONS.
AD-625 051 FLD. 9/1

•PITTSBURGH UNIV PA

• • •

DEOXYGENATION REACTIONS OF AMINE OXIDES ANDSULFOXIDES.
(AFOSR-69-1729)
AD-625 919 FLD. 7/3

• • •

INTERPRETATION OF THE SOFT X-RAY EMISSIONSPECTRUM OF LITHIUM METAL,
(AFOSR-69-2209)
AD-625 946 FLD. 20/2

•PITTSBURGH UNIV PA DEPT OF CHEMISTRY

• • •

THE REACTIONS OF 2- AND 4-PICOLINE N-OXIDESWITH PHENYLACETIC ANHYDRIDE.
AD-625 039 FLD. 7/3

•PITTSBURGH UNIV PA DEPT OF PHYSICS

• • •
ELECTRONIC AND IONIC COLLISION PROCESSES.
AD-629 313 FLD. 20/8

•PLANNING RESEARCH CORP LOS ANGELES CALIF
• • •
PRC-D-796
THE ECONOMIC FEASIBILITY OF DECENTRALIZEDMETROPOLITAN REGIONS.
AD-629 172 FLD. 19/3

•PLASMA LAB UNIV OF ARKANSAS FAYETTEVILLE
• • •
UAPL-29
INTERACTION OF PLASMA FLOWS AND MAGNETICFIELDS.
AD-629 579 FLD. 10/2

•PLASTICS TECHNICAL EVALUATION CENTER PICATINNY ARSENAL DOVER N J
• • •
PLASTEC-23
ELECTRICAL PROPERTIES OF PLASTIC MATERIALS:DATA COMPILED FROM TECHNICAL CONFERENCESEARCH.
AD-629 922 FLD. 11/9

•POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA
• • •
SCIENTIFIC-6
ON THE TURBULENCE DEVELOPMENT IN THEBOUNDARY LAYER WITH PRESSURE GRADIENT.
(AFOSR-69-2187)
AD-629 361 FLD. 20/9
• • •
TN-30
ON THE TURBULENCE DEVELOPMENT IN THEBOUNDARY LAYER WITH PRESSURE GRADIENT.
(AFOSR-69-2187)
AD-629 361 FLD. 20/9

•POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST
• • •
PIBMRI-1297-69
MODAL ANALYSIS AND SYNTHESIS OFELECTROMAGNETIC FIELDS.
(AFCRL-69-668)
AD-629 362 FLD. 20/3
• • •
PIBMRI-1299-69
MEASUREMENT TECHNIQUES FOR OVERSIZEDWAVEGUIDE.
AD-629 492 FLD. 9/1

•PRAIRIE REGIONAL LAB SASKATOON (SASKATCHEWAN)
• • •
BIOSYNTHESIS OF PULCHERRIMINIC ACID,
(NRC-8841)
AD-629 960 FLD. 6/1

•PRINCETON UNIV N J
• • •
RB-69-28
A DEVELOPMENTAL STUDY OF THE SEMANTICDIFFERENTIAL.
AD-629 903 FLD. 5/10
• • •
RM-69-17
SIMULATION MODELS FOR PSYCHOMETRIC THEORIES,
AD-629 974 FLD. 5/10

•PURDUE UNIV LAFAYETTE IND
• • •
INVESTIGATION OF FUSION AND FIXATION DISPARITYLIMITS FOR PHOTOGRAMMETRY.
AD-629 217 FLD. 5/10

•RADIATION RESEARCH ASSOCIATES INC FORT WORTH TEX
• • •
RRA-T69-1
MONTE CARLO CODES FOR STUDY OF LIGHTTRANSPORT IN THE ATMOSPHERE. VOLUME I:DESCRIPTION OF CODES. (ECOM-00240-F-VOL-1)
AD-629 115 FLD. 20/6
• • •
RRA-T69-2
MONTE CARLO CODES FOR STUDY OF LIGHTTRANSPORT IN THE ATMOSPHERE. VOLUME II:UTILIZATION INSTRUCTIONS. (ECOM-00240-F-VOL-2)
AD-629 116 FLD. 20/6

•RADIO CORP OF AMERICA CAMDEN N J DEFENSE ELECTRONIC PRODUCTS
• • •
MICROELECTRONIC SOLID-STATE DISPLAYASSEMBLY.
AD-629 370 FLD. 9/5

•RADIO CORP OF AMERICA NEW YORK DEFENSE ELECTRONIC PRODUCTS
• • •
CR-69-919-17
TUNABLE SOLID STATE GENERATOR.
AD-629 310 FLD. 9/5

•RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
• • •
TRANSISTOR, VHF, SILICON, POWER, LINEAR,30-MC, 100 WATTS PEP.
AD-629 328 FLD. 9/1

•RADIOLOCATION RESEARCH LAB UNIV OF ILLINOIS URBANA
• • •
RRL-259
A STUDY OF HIGH-FREQUENCY DIRECTIONALPROPAGATION OVER A 490 KILOMETER EAST-TOWEST PATH. PART I. DESCRIPTION OF THEDIRECTIONAL PROPAGATION EXPERIMENT (THECOLUMBUS EXPERIMENT). PART II. AN ATLAS OFREDUCED DATA.
AD-629 413 FLD. 17/3

•RAND CORP SANTA MONICA CALIF
• • •
P-1690
A MACRO ANALYSIS OF MILITARY AIR TRANSPORTATION,
AD-629 383 FLD. 15/5
• • •
P-2580
SYMPOSIUM ON METEOROLOGICAL ROCKETS,
AD-629 394 FLD. 14/2
• • •
P-2590
SOME ASPECTS OF AUTOMATIC TEST AND CHECKOUTIN MISSILE AND SPACE SYSTEMS,
AD-629 392 FLD. 16/1
• • •
P-2647
ECONOMIC PROBLEMS OF ESTABLISHING ACOMMUNICATIONS SATELLITE SYSTEM,
AD-629 381 FLD. 5/3
• • •
P-2701-1
TOWARD AN INFORMAL AND CREATIVECONFERENCE METHOD,
AD-629 234 FLD. 5/11
• • •
P-2728
LUNAR SURFACE VEHICLES, A BRIEF REVIEW OFCURRENT DESIGN CONCEPTS,
AD-629 390 FLD. 13/6
• • •
P-3170
A SURVEY OF THE WEAPONS AND HAZARDS WHICHMAY FACE THE PEOPLE OF THE UNITED STATES INWARTIME,
AD-629 291 FLD. 19/3
• • •
P-3243
THE TRANSFORMATION OF SENTENCES FORINFORMATION RETRIEVAL,
AD-629 890 FLD. 9/2
• • •
P-3277
THE RATE AND PATTERN OF INDUSTRIAL GROWTHIN COMMUNIST CHINA,
AD-629 902 FLD. 5/3
• • •
P-3282
ON THE SCATTERING OF SUNLIGHT INTO PLANETARYSHADOW CONES,
AD-629 260 FLD. 4/1
• • •
P-3286
THE EFFICIENT ACHIEVEMENT OF RAPIDTECHNOLOGICAL PROGRESS-A MAJOR NEWPROBLEM IN PUBLIC FINANCE,
AD-629 472 FLD. 5/1
• • •
RM-4286-PR
THERMAL PROTECTION FOR LIQUID-HYDROGENFUEL TANKS IN HIGH-SPEED, LONG-RANGEAIRCRAFT,
AD-629 407 FLD. 21/4
• • •
RM-4579-NIH
SPIKE PROBABILITIES IN NEURONES: INFLUENCEOF TEMPORAL STRUCTURE IN THE TRAIN OFSYNAPTIC EVENTS,
AD-629 410 FLD. 6/5
• • •
RM-4732-ARPA
SIMPLIFIED NORMAL MODE TREATMENT OFLONG-PERIOD ACOUSTIC-GRAVITY WAVES IN THEATMOSPHERE,
AD-629 232 FLD. 17/1
• • •
RM-4741-ARPA
EFFECTS OF PROPAGATION ON THE HIGH-FREQUENCYELECTROMAGNETIC RADIATION FROM LOW-ALTITUDENUCLEAR EXPLOSIONS,
AD-629 074 FLD. 18/3
• • •
RM-4747-PR
NUMERICAL ESTIMATES OF LUMINANCE ANDTOTAL BRIGHTNESS OF THE TERRESTRIAL HALO,
AD-629 233 FLD. 4/1
• • •
RM-4763-PR
LORENTZ INVARIANCE, MOMENTUM-ENERGYTENSORS, AND THE N H D PROBLEM,
AD-629 268 FLD. 20/9
• • •
RM-4793-PR
RELATIONAL DATA FILE: A TOOL FOR MECHANIZEDINFERENCE EXECUTION AND DATA RETRIEVAL,
AD-629 909 FLD. 9/2
• • •
RM-4818-PR
PHOTOCHEMICAL DESTABILIZATION OF GRAVITYWAVES NEAR THE MESOPAUSE,
AD-629 011 FLD. 4/1

•REDSTONE SCIENTIFIC INFORMATION CENTER REDSTONE ARSENAL ALA
• • •
RSIC-476
EQUATIONS FOR THE PERTURBED MOTION OF ARIGID BODY WITH A CYLINDRICAL CAVITYPARTIALLY FILLED WITH LIQUID,
(TT-66-60093)
AD-629 517 FLD. 20/11

•RENSSELAER POLYTECHNIC INST TROY N Y
• • •
DISCUSSION,
AD-629 892 FLD. 8/13
• • •
CONSOLIDATION DUE TO TANGENTIAL LOADS(CONSOLIDATION PRODUITE PAR DES CHARGES TANGENTIELLES),
AD-629 113 FLD. 13/13

•RENSSELAER POLYTECHNIC INST TROY N Y DEPT OF CHEMISTRY

• • •
VISCOSITY MEASUREMENTS OF IONIC MELTS ATTEMPERATURES TO 1100C.
(AFOSR-69-2200)
AD-629 536 FLD. 7/9

*RESEARCH ANALYSIS CORP MCLEAN VA
• • •
RAC-P-12
APPLICATION OF CHANCE-CONSTRAINED PROGRAMMING TO SOLUTION OF THE SO-CALLED 'SAVINGSAND LOAN ASSOCIATION' TYPE OF PROBLEM,
AD-629 050 FLD. 12/2
• • •
RAC-TP-143
A GENERAL THEORY OF FINITE SEQUENTIALDECISION PROCESSES.
AD-629 048 FLD. 12/1
• • •
RAC-TP-160
MODERN UTILITY THEORY: 1990-1970.
AD-629 047 FLD. 12/2

*RESEARCH FOUNDATION FOR MENTAL HYGIENE NEW YORK
• • •
RESEARCH ON THE METABOLISM OF GLUTATHIONE,GLUTAMINE, AND RELATED COMPOUNDS.
AD-629 999 FLD. 6/16

*RESEARCH INST TEMPLE UNIV PHILADELPHIA PA
• • •
PLASMA JET CHEMISTRY.
(AFOSR-69-1802)
AD-629 591 FLD. 20/9

*RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
• • •
LONGITUDINAL WAVES IN A WEAKLY IONIZEDGAS,
AD-629 879 FLD. 20/9

*ROCKET POWER INC PASADENA CALIF RESEARCH LABS
• • •
THERMODYNAMIC PROPERTIES OF ROCKET EXHAUSTPRODUCTS.
AD-629 598 FLD. 21/9

*ROCKETDYNE CANOGA PARK CALIF
• • •
R-6213
RESPONSE OF A BURNING SOLID PROPELLANT TOPRESSURE WAVES OF FINITE AMPLITUDE.
(AFOSR-69-1733)
AD-629 999 FLD. 21/9

*ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y
• • •
RADC-TDR-69-990-V2
MULTIPLEXER SET AN/FCC-17( ) ANDMULTIPLEXER SET AN/MCC-12.
AD-629 949 FLD. 9/5

*RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF PHYSICS
• • •
RELAXATION OF DILUTED NICKEL FLUOSILICATEAT LOW TEMPERATURES BY STEADY-STATERESONANCE ABSORPTION TECHNIQUES.
AD-629 599 FLD. 20/12

*SAN ANTONIO AIR MATERIEL AREA KELLY AFB TEX
• • •
MINUTES OF THE PERSONAL EQUIPMENT ADVISORYGROUP MEETING HELD 11-12 OCT 1965 AT ATLANTICCITY, NEW JERSEY.
AD-629 901 FLD. 6/17

*SCANWELL LABS INC SPRINGFIELD VA
• • •
A LARGE, LOW-COST STEERABLE PLANAR ARRAY.
(AFCRL-69-797)
AD-629 880 FLD. 9/5

*SCIENTIFIC-ATLANTA INC GA
• • •
RECIPROCAL TEM FERRITE PHASE SHIFTERS.
AD-629 209 FLD. 9/5

*SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE PHYSICAL LAB
• • •
MPL-U-22/69
STABILITY OF A HOMOGENEOUS FLUID COOLEDUNIFORMLY FROM ABOVE,
AD-629 984 FLD. 20/4
• • •
MPL-U-62/69
THE EFFECT OF PRESSURE ON THE DISSOCIATIONOF MANGANESE SULFATE ION PAIRS IN WATER,
AD-629 985 FLD. 7/4
• • •
MPL-U-76/69
THE SCATTERING OF PLANE WAVES FROMPERIODIC SURFACES,
AD-629 986 FLD. 20/1

*SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
• • •
CONCENTRATIONS OF COMMON LEAD INGREENLAND SNOWS,
AD-629 997 FLD. 8/5
• • •
RADIOGENIC LEADS OF THE CANADIAN ANDBALTIC SHIELD REGIONS,
AD-629 998 FLD. 8/5
• • •
STRUCTURE OF THE CONTINENTAL MARGIN OFFCENTRAL CALIFORNIA,
AD-629 999 FLD. 8/7
• • •
ISOTOPIC OCEANOGRAPHY: DEUTERIUM ANDOXYGEN 18 VARIATIONS IN THE OCEAN AND THEMARINE ATMOSPHERE,
AD-629 490 FLD. 8/10

*SHEFFIELD UNIV (ENGLAND) DEPT OF FUEL TECHNOLOGY AND CHEMICAL ENGINEERING
• • •
MIC-84
INTENTIONAL COMBUSTION OSCILLATIONS INPROPULSION SYSTEMS.
(AFOSR-69-1809)
AD-629 499 FLD. 21/8

*SOCIETY OF PHOTOGRAPHIC SCIENTISTS AND ENGINEERS WASHINGTON D C
• • •
1969 SYMPOSIUM ON PHOTOGRAPHY IN INFORMATIONSTORAGE AND RETRIEVAL, OCTOBER 21-22, 1969.
AD-629 029 FLD. 5/2

*SOUTHWEST RESEARCH INST SAN ANTONIO TEX
• • •
THE STUDY AND EVALUATION OF ABSORPTION-BASEDCOOLING SYSTEMS FOR USE IN CIVIL DEFENSESHELTERS.
AD-629 936 FLD. 13/1
• • •
LUBRICATION RESEARCH FOR AERO PROPULSIONSYSTEMS.
(APL-TR-69-118)
AD-629 989 FLD. 11/8

*SPACE DATA CORP PHOENIX ARIZ
• • •
SDC-TN-92
DESIGN, DEVELOPMENT AND FLIGHT TEST RESULTSOF THE LOKI INSTRUMENTED DART SYSTEM.
(AFCRL-69-0449)
AD-629 981 FLD. 9/2

*SPERRY RAND RESEARCH CENTER SUDBURY MASS
• • •
SCIENTIFIC-3
ELECTRON THERMAL DIFFUSIVITY IN RARE-GASAFTERGLOW PLASMAS,
(AFCRL-69-842)
AD-629 082 FLD. 20/9
• • •
SRRC-RR-69-96
ELECTRON THERMAL DIFFUSIVITY IN RARE-GASAFTERGLOW PLASMAS,
(AFCRL-69-842)
AD-629 082 FLD. 20/9

*SPRINGFIELD ARMORY MASS
• • •
SA-TR18-1099
DEVELOPMENT OF A FIXTURE AND A PROCEDUREFOR HARD-ANODIZING THE SURFACES OF A LONGALUMINUM TUBE WITH A DEEP BLIND-HOLE.
AD-629 993 FLD. 11/3

*STANFORD RESEARCH INST MENLO PARK CALIF
• • •
SWISS CIVIL DEFENSE.
AD-629 929 FLD. 15/3
• • •
SECONDARY IGNITIONS IN NUCLEAR ATTACK.
AD-629 173 FLD. 13/12
• • •
THE POTENTIAL OF MASS PRODUCTION FORREDUCING COSTS IN SHELTER CONSTRUCTION, APRELIMINARY SURVEY.
AD-629 238 FLD. 13/13
• • •
THE TAMM VARIATIONAL PRINCIPLE AND ITSGENERALIZATION TO THE SCATTERING AMPLITUDE.
AD-629 278 FLD. 20/10
• • •
CORRELATION BETWEEN CLEAR-AIR TURBULENCEAND AIRCRAFT ELECTRICAL ACTIVITY.
(AFCRL-69-614)
AD-629 309 FLD. 4/1
• • •
DISINTEGRATION RATE MULTIPLIERS IN BETAEMITTER DOSE CALCULATIONS.
AD-629 359 FLD. 6/18
• • •
ELECTRICAL EFFECTS OF SHOCK WAVES: CONDUCTIVITY IN CSI, KI, AND NACL.
AD-629 968 FLD. 20/11
• • •
EQUATION OF STATE OF SOLIDS: ALUMINUM ANDTEFLON.
(WL-TR-69-147)
AD-629 979 FLD. 20/13
• • •
SRI-TR-9
THE PHYSICAL CHEMISTRY AND STABILITY OFBUBBLES WITH SPECIAL REFERENCE TO AQUEOUSSOLUTIONS. SURFACE VISCOSITY OF DETERGENTSOLUTIONS AS A FACTOR IN FOAM STABILITY.
AD-629 346 FLD. 11/11
• • •
TR-5
TRANSFER OF AIR THROUGH ADSORBED SURFACEFILMS AS A FACTOR IN FOAM STABILITY.
AD-629 344 FLD. 11/11
• • •
TR-6
PRIMARY ADSORPTION DURING FOAM FORMATION.
AD-629 345 FLD. 11/11

*STANFORD UNIV CALIF
• • •
FACTORS INVOLVED IN THE STABILITY OFCYCLOPROPANES.
(AFOSR-69-1793)
AD-629 080 FLD. 7/3

•STANFORD UNIV CALIF DEPT OF AERONAUTICS AND ASTRONAUTICS
• • •
SUDAER-227
THE SNAP-THROUGH AND POSTBUCKLINGEQUILIBRIUM BEHAVIOR OF CIRCULAR CYLINDRICALSHELLS UNDER AXIAL LOAD,
(AFOSR-69-1988)
AD-629 279 FLD. 20/11
• • •
SUDAER-231
ELASTIC-PLASTIC ANALYSIS OF THE COLLAPSEOF UNIFORMLY COMPRESSED CIRCULAR CYLINDRICALSHELLS,
(AFOSR-69-1987)
AD-629 276 FLD. 20/11

•STANFORD UNIV CALIF DEPT OF MATERIALS SCIENCE
• • •
SU-DMS-69-33
SOME ASPECTS OF DISLOCATION DYNAMICS INMETALS AND THE INFLUENCE OF DISLOCATIONDISTRIBUTION ON LOW TEMPERATURE ELECTRICALTRANSPORT PROPERTIES,
AD-629 029 FLD. 20/2

•STANFORD UNIV CALIF DEPT OF STATISTICS
• • •
TR-112
STATISTICAL METHODS OF TIME SEQUENCING.
AD-629 960 FLD. 12/1

•STANFORD UNIV CALIF RADIO ASTRONOMY INST
• • •
REPRINT-R-31
HIGH-RESOLUTION OBSERVATIONS OF THE RADIOSUN AT 9.1 CENTIMETERS ON JULY 20, 1962,
(AFOSR-68-2259)
AD-629 366 FLD. 3/2

•STANFORD UNIV CALIF STANFORD ELECTRONICS LABS
• • •
SEL-69-083
EXPERIMENTAL INVESTIGATION OF THE COHERENCEDISTANCE OF THE ATMOSPHERE FOR MICROWAVES.
(AFCRL-69-289)
AD-629 991 FLD. 20/14

•STATE UNIV OF NEW YORK BUFFALO
• • •
TR-10
THE EFFECT OF VARIATIONS IN INTERNAL POWERPATTERN ON COALITION FORMATION IN TETRADS.
AD-629 492 FLD. 5/10

•SWIFT AND CO CHICAGO ILL
• • •
DETERMINATION OF EQUIVALENCE BETWEENRADIATION STERILIZATION PROCESS AND COMMERCIAL THERMAL PROCESS FOR CURED MEATS.
AD-629 252 FLD. 6/8

•SYRACUSE UNIV N Y
• • •
NUCLEAR SPIN RELAXATION IN PI-TYPE INSB ATLIQUID-HELIUM TEMPERATURES,
(AFOSR-69-1904)
AD-629 978 FLD. 20/12

•SYRACUSE UNIV N Y DEPT OF PHYSICS
• • •
TR-3
ANTIFERROMAGNETIC SPIN RESONANCE OFCOBR2.6H2O,
AD-629 939 FLD. 20/3

•SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY
• • •
A POLYSACCHARIDE GRAFT COPOLYMER PREPAREDBY ANIONIC COUPLING,
(AROD-4629 1)
AD-629 174 FLD. 11/9

•SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
• • •
SCIENTIFIC-4
FAILURE OF A CONJECTURE ABOUT CONTEXTFREE LANGUAGES,
(AFCRL-69-806)
AD-624 939 FLD. 9/2
• • •
SDC-TM-2624/100/00
PROCEEDINGS OF THE SYMPOSIUM ON COMPUTERCENTERED DATA BASE SYSTEMS (2ND).
AD-629 917 FLD. 9/2
• • •
SP-1923/000/00
THE SYSTEM VIEW AND THE DISENCHANTEDEXECUTIVE.
AD-629 002 FLD. 5/1
• • •
SP-1896/000/01
THE DESIGN OF MAN-MACHINE SYSTEMS INEDUCATION.
AD-624 942 FLD. 5/9
• • •
SP-2030/001/02
THEORY, PRACTICE, AND TREND IN BUSINESSPROGRAMMING.
AD-629 003 FLD. 9/2
• • •
SP-2213
COMPUTERS IN SYSTEMS OF HIGHER EDUCATION,
AD-624 937 FLD. 5/9
• • •
SP-2234
DECISION THEORY AS APPLIED TO PERSONNELCLASSIFICATION AND EVALUATION.
AD-629 004 FLD. 5/9
• • •
SP-2261/000/00
COMPUTER SIMULATION OF ROLE CONFLICTRESOLUTION,
AD-624 941 FLD. 5/9
• • •
SP-2279/000/00
NATURAL-LANGUAGE PROCESSING BY COMPUTERS-1966.
AD-629 005 FLD. 5/7
• • •
TM-738/014/00
DETERMINISTIC CONTEXT FREE LANGUAGES,
(AFCRL-69-415)
AD-624 938 FLD. 9/2
• • •
TM-738/017/00
ALGORITHMIC LANGUAGES PROJECT.
(AFCRL-69-797)
AD-624 940 FLD. 9/2
• • •
TM-738/019/00
FAILURE OF A CONJECTURE ABOUT CONTEXTFREE LANGUAGES,
(AFCRL-68-806)
AD-624 939 FLD. 9/2
• • •
TM-2543
A PERSONALITY/ATTITUDE SCHEDULE FOR USE INEXPERIMENTAL BARGAINING STUDIES.
AD-624 992 FLD. 5/10

•SYSTEMS TECHNOLOGY INC HAWTHORNE CALIF
• • •
TR-140-1
AN ANALYTICAL STUDY OF V/STOL HANDLINGQUALITIES IN HOVER AND TRANSITION.
(AFFDL-TR-69-73)
AD-629 599 FLD. 1/2

•TEACHERS COLL COLUMBIA UNIV NEW YORK
• • •
THE EFFECT OF ROLE-REVERSAL DURINGTHE DISCUSSION OF OPPOSING VIEWPOINTS.
AD-624 919 FLD. 5/10
• • •
TECHNIQUES OF INDUCING COOPERATIONBETWEEN ADVERSARIES.
AD-624 921 FLD. 5/10
• • •
TR-1
CONFLICT AND ITS RESOLUTION.
AD-624 918 FLD. 5/10
• • •
TR-3
REWARD STRUCTURE AND INFORMATION IN THEDEVELOPMENT OF COOPERATION IN TWO-PERSON,TWO-CHOICE GAMES.
AD-624 920 FLD. 5/10

•TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF CHEMISTRY
• • •
INFRARED SPECTRA OF POLYATOMIC HIGHTEMPERATURE MOLECULES.
(AFML-69-420)
AD-629 049 FLD. 7/2

•TECHNOLOGY INC DAYTON OHIO
• • •
MEASUREMENT OF WIND SHEAR.
AD-629 335 FLD. 4/2

•TEXAS INSTRUMENTS INC DALLAS
• • •
ARRAY RESEARCH.
AD-629 556 FLD. 8/11
• • •
US-807250-5
MICROELECTRONIC FREQUENCY AND TIMESTANDARD.
AD-629 316 FLD. 14/2

•TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
• • •
AN INVENTORY OF GEOGRAPHIC RESEARCH OFTHE HUMID TROPIC ENVIRONMENT. VOLUME I.KWIC INDEX. HUMID TROPIC ENVIRONMENTALLITERATURE,
AD-629 926 FLD. 8/6
• • •
MULTIPLE ARRAY PROCESSOR.
AD-629 491 FLD. 8/11
• • •
CUMBERLAND PLATEAU SEISMOLOGICALOBSERVATORY.
AD-629 592 FLD. 8/11
• • •
CUMBERLAND PLATEAU SEISMOLOGICALOBSERVATORY.
AD-629 593 FLD. 8/11
• • •
MULTIPLE ARRAY PROCESSOR.
AD-629 595 FLD. 8/11
• • •
MULTIPLE ARRAY PROCESSOR.
AD-629 607 FLD. 8/11

•TEXAS TECHNOLOGICAL COLL LUBBOCK DEPT OF CHEMISTRY
• • •
THERMODILATOMETRIC ANALYSIS: SOMECHEMICAL APPLICATIONS,
(AFOSR-69-2394)
AD-629 589 FLD. 7/4
• • •
ION RADICALS. VII. THE REACTIONS OFTHIANTHRENE OXIDE IN HYDROCHLORIC ACID,
(AFOSR-69-2393)
AD-629 590 FLD. 7/3
• • •
ION RADICALS. VI. PHENOXATHIIN ANDPHENOXATHIIN 5-OXIDE IN SULFURIC ACID,
(AFOSR-69-2391)
AD-629 592 FLD. 7/3
• • •

ION RADICALS. V. PHENOTHIAZINE, PHENOTHIAZINE-5-OXIDE, AND PHENOTHIAZONE-5 IN ACID SOLUTIONS,
(AFOSR-69-2292)
AD-629 593 FLD. 7/3

•TEXAS UNIV AUSTIN
• • •
DISCRETE REPRESENTATIONS OF PARTIALDIFFERENTIAL OPERATORS.
(AROD-3772:9)
AD-629 694 FLD. 12/1

•TEXAS UNIV AUSTIN DEPT OF ASTRONOMY
• • •
SPECTROSCOPIC AND RADIAL VELOCITY SURVEYOF BRIGHT GALAXIES.
AD-629 900 FLD. 3/2

•TORONTO UNIV (ONTARIO) DEPT OF CARDIOVASCULAR SURGERY
• • •
EFFECTS OF HYPOTHERMIA ON DISAPPEARANCE OFETHANOL FROM ARTERIAL BLOOD,
AD-629 921 FLD. 6/5

•TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS
• • •
RADIOSENSITIVITY OF THE IMMUNE RESPONSE TOSHEEP RED CELLS IN THE MOUSE, AS MEASURED BYTHE HEMOLYTIC PLAQUE METHOD,
AD-629 902 FLD. 6/18
• • •
THE CELLULAR BASIS OF THE GENETICALLYDETERMINED HEMOPOIETIC DEFECT IN ANEMICMICE OF GENOTYPE SI/SI(D),
AD-629 929 FLD. 6/16

•TORONTO UNIV (ONTARIO) DEPT OF PHYSIOLOGY
• • •
THE EFFECT OF TOLBUTAMIDE (RASTINON) ONTHE LEVELS OF GLUCOSE AND INORGANIC PHOSPHORUS OF BLOOD IN NORMOTHERMIC AND HYPOTHERMIC RATS,
AD-629 908 FLD. 6/19
• • •
THE INACTIVATION OF ANTITHROMBIN BY ETHER:EVIDENCE AGAINST THE EXISTENCE OFANTITHROMBIN IV,
AD-629 920 FLD. 6/16

•TUFTS UNIV MEDFORD MASS DEPT OF BIOLOGY
• • •
SUMMARY REPORT.
(AFOSR-69-2223)
AD-629 039 FLD. 6/3

•TUFTS UNIV MEDFORD MASS DEPT OF CHEMISTRY
• • •
DIELECTRIC DISPERSION.
AD-629 609 FLD. 7/4

•TULANE UNIV NEW ORLEANS LA DEPT OF MECHANICAL ENGINEERING
• • •
A FLOW MODEL AND ANALYSIS OF A ROCKET PAIRIN CLOSE PROXIMITY,
AD-629 966 FLD. 19/4

•UED EARTH SCIENCES DIV TELEDYNE INC ALEXANDRIA VA
• • •
SEISMIC DATA LABORATORY.
AD-629 949 FLD. 8/11
• • •
SEISMIC DATA LABORATORY.
AD-629 947 FLD. 8/11

•UNITED AIRCRAFT CORP EAST HARTFORD CONN
• • •
TERMINAL WEATHER PREDICTION TECHNIQUES.
(ESD-TR-69-477)
AD-629 099 FLD. 4/2

•UNITED ELECTRODYNAMICS INC PASADENA CALIF
• • •
UED-371-1669-0026
TONTO FOREST SEISMOLOGICAL OBSERVATORY.
AD-629 969 FLD. 8/11

•UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER
• • •
PROTECTIVE COATINGS FOR DEEP SUBMERGENCEVESSELS.
AD-629 896 FLD. 11/3

•UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES ELECTRONIC SCIENCES LAB
• • •
CONSOLIDATED SEMIANNUAL PROGRESS REPORTNO. 2, 1 APRIL 1969 THROUGH 30 SEPTEMBER 1969,
AD-629 971 FLD. 20/12

•UNIVERSITY OF WESTERN ONTARIO LONDON DEPT OF PHARMACOLOGY
• • •
BRAIN LESIONS AND HYPERBARIC OXYGENCONVULSIONS,
AD-629 927 FLD. 6/5

•UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP
• • •
SCIENTIFIC-16
STUDIES IN PERTURBATION THEORY. XI. LOWERBOUNDS TO ENERGY EIGENVALUES, GROUND STATEAND EXCITED STATES,
(ARL-69-298)
AD-629 964 FLD. 20/10
• • •
SCIENTIFIC-27
LOWER BOUNDS FOR THE EIGENVALUES OF FIRSTORDER DENSITY MATRICES,
(ARL-69-299)
AD-629 212 FLD. 7/4
• • •
SCIENTIFIC-28 SCIENTIFIC-29
DIFFERENT BANDS FOR DIFFERENT SPINS. I. THECOHESIVE ENERGY OF AN ALKALI METAL. II. APPLICATION TO A LINEAR CHAIN OF HYDROGEN ATOMS.CRYSTAL INTEGRALS AND MOLECULAR INTEGRALS,
(ARL-69-296)
AD-629 911 FLD. 7/4
• • •
SCIENTIFIC-33
THE INDEPENDENT PARTICLE MODEL FOR MANYELECTRON SYSTEM. II. SYMMETRY PROPERTIES ANDCRITERIA FOR THE VALIDITY OF THE INDEPENDENTPARTICLE MODEL.
(ARL-69-290)
AD-629 213 FLD. 7/4
• • •
SCIENTIFIC-36
THE INTERACTION POTENTIAL SURFACE FOR H3.
(ARL-69-291)
AD-629 214 FLD. 7/4
• • •
SCIENTIFIC-37
THEORY OF INTERNAL RELAXATION IN CHEMICALKINETICS,
(ARL-69-292)
AD-629 377 FLD. 7/4
• • •
SCIENTIFIC-38
COUPLING BETWEEN THE ENERGY GAP ANDSINGLE PARTICLE ENERGY FOR NUCLEAR MATTER,
(ARL-69-297)
AD-629 398 FLD. 20/8
• • •
SCIENTIFIC-42
CONCERNING THE ROOTS OF A POLYNOMIAL WHICHCONTAIN A PERTURBATION PARAMETER,
(ARL-69-298)
AD-629 912 FLD. 12/1

•UTAH STATE UNIV LOGAN ELECTRO-DYNAMICS LABS
• • •
DUAL-CHANNEL SATELLITE RADIOMETER.
(AFCRL-69-491)
AD-629 380 FLD. 17/5

•VELA SEISMIC INFORMATION ANALYSIS CENTER UNIV OF MICHIGAN ANN ARBOR
• • •
BULL-33
VESIAC MONTHLY BULLETIN OF VELA UNIFORMRESEARCH PUBLICATIONS,
AD-629 006 FLD. 8/11
• • •
BULL-34
VESIAC MONTHLY BULLETIN OF VELA UNIFORMRESEARCH PUBLICATIONS.
AD-629 221 FLD. 8/11

•VITRO LABS SILVER SPRING MD
• • •
VITRO-TN-01856.01-9
THE DEFINITION OF REQUIREMENTS FOR A SEALAUNCHED MISSILE INFORMATION-ANALYSISCENTER.
AD-629 193 FLD. 9/2

•WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
• • •
STUDIES OF THE DYNAMO ACTION OF THE LIQUIDCORE OF THE EARTH.
(AFCRL-69-609)
AD-629 987 FLD. 8/14
• • •
TR-14(60)
DETERMINATION OF PARTICLE SIZEDISTRIBUTIONS IN EMULSIONS BY LIGHTSCATTERING.
AD-629 940 FLD. 7/4

•WEATHER BUREAU WASHINGTON D C
• • •
THE DIURNAL VARIATION OF THE VECTORSURFACE WIND AT SEVERAL ICE CAP STATIONS.
AD-629 960 FLD. 4/2

•WESTERN AUSTRALIA UNIV PERTH
• • •
THE PLACE OF SUBJECTIVE EXPERIENCE INCONTEMPORARY PSYCHOLOGY.
AD-629 109 FLD. 5/10

•WESTERN RESERVE UNIV CLEVELAND OHIO CENTER FOR DOCUMENTATION AND COMMUNICATION RESEARCH
• • •
USE OF META-LANGUAGE IN INFORMATIONRETRIEVAL SYSTEMS.
(AFOSR-69-1920)
AD-629 977 FLD. 5/2

•WESTINGHOUSE ELECTRIC CORP LIMA OHIO AEROSPACE ELECTRICAL DIV
• • •
100 WATT THERMOELECTRIC POWER SYSTEM FORBUOY APPLICATIONS.
AD-629 978 FLD. 10/2

•WESTINGHOUSE RESEARCH LABS PITTSBURGH PA
• • •
RR-69-9E2-511-R1
BASIC PLASMA PROCESSES.
AD-629 927 FLD. 20/9

•WHIRLPOOL CORP ST JOSEPH MICH SYSTEMS DIV
• • •
EFFECT OF EXPOSURE TO OXYGEN ON

CHANGESIN MEATS AND VEGETABLES DURING STORAGE.
AD-625 484 FLD. 6/8

•WISCONSIN ALUMNI RESEARCH FOUNDATION MADISON
• • •
SURVEY OF EXISTING METHODS OF FEEDING ANDHOUSING THE CHIMPANZEE. (ARL-TR-65-11)
AD-625 101 FLD. 6/3

•WISCONSIN UNIV MADISON
• • •
MECHANISMS OF TRANSGRANULAR STRESSCORROSION CRACKING OF SOLID SOLUTION ALLOYS, (AFOSR-65-1903)
AD-625 554 FLD. 11/6

•WISCONSIN UNIV MADISON DEPT OF STATISTICS
• • •
TR-43
A CHANGE IN LEVEL OF A NON-STATIONARY TIMESERIES.
AD-625 456 FLD. 12/1
• • •
TR-48
MIXTURE DESIGNS FOR FOUR FACTORS.
AD-625 269 FLD. 12/1
• • •
TR-49
BAYESIAN COMPARISON OF MEANS OF A MIXEDMODEL WITH APPLICATION TO REGRESSION ANALYSIS.
AD-625 271 FLD. 12/1

TR-50
THE USE OF THE CONCEPT OF A FUTURE OBSERVATION IN GOODNESS OF FET PROBLEMS.
AD-625 270 FLD. 12/1
• • •
TR-52
MISSING VALUES IN MULTIVARIATE STATISTICS.I. REVIEW OF THE LITERATURE.
AD-625 269 FLD. 12/1

•WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST
• • •
QUANTUM-MECHANICAL BOLTZMANN EQUATION,
AD-624 881 FLD. 20/10

•WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
• • •
REF-65-56
HEAT FLUX AND SURFACE STRESS ON AND NEARAN ISLAND IN THE TRADE WIND REGION.
AD-625 180 FLD. 4/2

• • •
TM-1-69
CRUISE PLANS FOR R/V CHAIN CRUISE NO. 43,INDIAN OCEAN EXPEDITION.
AD-625 444 FLD. 8/10
• • •
WHOI-CONTRIB-1669
CONTAMINATION OF A LABORATORY BUILDINGBY AIR FILTERS,
AD-625 306 FLD. 14/2

WHOI-REF-65-58
CONTAMINATION OF A LABORATORY BUILDINGBY AIR FILTERS,
AD-625 306 FLD. 14/2

•YALE UNIV NEW HAVEN CONN
• • •
A DUAL-CHANNEL PULSE-COUNTING ASTRONOMICALSPECTROPHOTOMETER,
AD-624 882 FLD. 3/2
• • •
SEARCH FOR PLANETARY OPTICAL EMISSION,AND STUDY OF FLARE ACTIVITY OF NEARBY STARS.
AD-624 895 FLD. 3/2
• • •
PROGRESS REPORT, JANUARY 1, 1966,
AD-625 429 FLD. 20/9

•YALE UNIV NEW HAVEN CONN DEPT OF CHEMISTRY
• • •
CARBALKOXYNITRENES. THE PHOTOLYTIC DECOMPOSITION OF GASEOUS ALKYL AZIDOFORMATES, (AFOSR-65-2202)
AD-625 537 FLD. 8/1

•YALE UNIV NEW HAVEN CONN OBSERVATORY
• • •
ON JOVIAN H-ALPHA AURORAL ACTIVITY,
AD-624 883 FLD. 3/2

•YERKES OBSERVATORY WILLIAMS BAY WIS
• • •
SPECTRAL CLASSIFICATION AND SPECTROSCOPICSTUDIES.
AD-625 493 FLD. 3/2



799-657 O - 66 -

# CONTRACT INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper).


•539
VITRO LABS SILVER SPRING MD
VITRO-TN-01856.01-4
AD-625 193 FLD. 5/2

•AF04(611)-10378
CATHOLIC UNIV OF AMERICA
WASHINGTON D C STRESS ANALYSIS LABS
AD-625 220 FLD. 21/9

•AF04(611)-10388
CATHOLIC UNIV OF AMERICA
WASHINGTON D C
AD-625 219 FLD. 20/11

•AF04(611)-10929
ROCKET POWER INC PASADENA CALIF
RESEARCH LABS
AD-625 598 FLD. 21/9

•AF04(694)-593
MASSACHUSETTS INST OF TECH
CAMBRIDGE INSTRUMENTATION LAB
E-1866
AD-625 042 FLD. 17/7

•AF04(694)-597
CONDUCTRON CORP ANN ARBOR MICH
BR/D-3
AD-625 386 FLD. 17/9

•AF18(603)-52
STANFORD UNIV CALIF RADIO ASTRONOMY INST
REPRINT-R-31
(AFOSR-65-2295)
AD-625 366 FLD. 3/2

•AF19(604)-7249
STANFORD UNIV CALIF STANFORD ELECTRONICS LABS
SEL-65-083
(AFCRL-65-285)
F AD-624 991 FLD. 20/14

•AF19(604)-7261
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF METEOROLOGY
(AFCRL-64-1005-P2)
F AD-625 137 FLD. 4/1
(AFCRL-64-1005-PT-1)
F AD-625 348 FLD. 4/2

•AF19(604)-7376
LAMONT GEOLOGICAL OBSERVATORY
PALISADES N Y
703
(AFCRL-65-792)
AD-625 308 FLD. 8/7

•AF19(604)-7429
DENVER UNIV COLO DEPT OF PHYSICS
(AFCRL-65-755)
F AD-625 349 FLD. 4/1

•AF19(628)-324 GRANT
CALIFORNIA UNIV BERKELEY
ELECTRONICS RESEARCH LAB
(AFOSR-65-2194)
AD-625 583 FLD. 9/1

•AF19(628)-342
MICROWAVE LAB STANFORD UNIV CALIF
ML-1343
(AFCRL-65-665)
F AD-625 315 FLD. 20/1

•AF19(628)-379
NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH
SCIENTIFIC-21
(AFCRL-65-802)
AD-625 379 FLD. 9/1

•AF19(628)-493
ADAMS (CHARLES W) ASSOCIATES INC
CAMBRIDGE MASS
(AFCRL-65-736)
F AD-625 181 FLD. 9/2

•AF19(628)-800
LINCOLN LAB MASS INST OF TECH
LEXINGTON
TR-394
(ESD-TDR-65-239)
AD-624 936 FLD. 9/6

•AF19(628)-2390
MITRE CORP BEDFORD MASS
TM-04063
(ESD-TR-65-405)
AD-624 893 FLD. 5/3
TM-03728
(ESD-TR-65-79)
AD-624 894 FLD. 5/3

•AF19(628)-2497
WAYNE STATE UNIV DETROIT MICH
DEPT OF CHEMISTRY
(AFCRL-65-609)
F AD-625 457 FLD. 8/14

•AF19(628)-3308
STANFORD RESEARCH INST MENLO PARK CALIF
(AFCRL-65-614)
F AD-625 309 FLD. 4/1

•AF19(628)-3322
HARVARD COLL OBSERVATORY CAMBRIDGE MASS SOLAR DEPT
SCIENTIFIC-5
(AFCRL-65-841)
AD-625 381 FLD. 3/2

•AF19(628)-3418
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
TM-738/019/00
(AFCRL-65-415)
AD-624 938 FLD. 9/2
TM-738/017/00
(AFCRL-65-797)
F AD-624 940 FLD. 9/2

•AF19(628)-3497
UNITED AIRCRAFT CORP EAST HARTFORD CONN
(ESD-TR-65-477)
F AD-625 094 FLD. 4/2

•AF19(628)-4005
ACADIA UNIV WOLFVILLE (NOVA SCOTIA)
(AFCRL-65-202)
F AD-624 887 FLD. 8/2

•AF19(628)-4014 GRANT
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
SCIENTIFIC-259
(AFCRL-65-872)
AD-625 609 FLD. 20/14

•AF19(628)-4039
SCANWELL LABS INC SPRINGFIELD VA
(AFCRL-65-757)
F AD-624 880 FLD. 9/5

•AF19(628)-4164
SPACE DATA CORP PHOENIX ARIZ
SDC-TM-92
(AFCRL-65-844)
F AD-625 481 FLD. 4/2

•AF19(628)-4167
MARTIN CO BALTIMORE MD
SCIENTIFIC-1
(AFCRL-65-579)
AD-625 453 FLD. 22/3

•AF19(628)-4183
SPERRY RAND RESEARCH CENTER
SUDBURY MASS
SRRC-RR-65-96
(AFCRL-65-842)
AD-625 082 FLD. 20/9

•AF19(628)-4209
UTAH STATE UNIV LOGAN ELECTRO-DYNAMICS LABS
(AFCRL-65-491)
F AD-625 380 FLD. 17/9

•AF19(628)-4240
CONTROLS FOR RADIATION INC
CAMBRIDGE MASS
(AFCRL-65-720)
F AD-624 884 FLD. 20/12

•AF19(628)-4297
HUGHES RESEARCH LABS MALIBU CALIF
SCIENTIFIC-1
(AFCRL-65-815)
AD-625 451 FLD. 7/4

•AF19(628)-4329
POLYTECHNIC INST OF BROOKLYN N Y
MICROWAVE RESEARCH INST
PIBMRI-1257-65
(AFCRL-65-668)
AD-625 362 FLD. 20/3

•AF19(628)-4790
PARKE MATHEMATICAL LABS INC
CARLISLE MASS
SCIENTIFIC-2
(AFCRL-65-805)
AD-625 081 FLD. 12/1

•AF19(628)-4961
COLORADO UNIV BOULDER LAB FOR ATMOSPHERIC AND SPACE PHYSICS
(AFCRL-6670)
AD-625 337 FLD. 20/6

•AF19(628)-5166
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
TM-738/019/00
(AFCRL-65-806)
AD-624 939 FLD. 9/2

•AF19(628)-5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
JA-2493
(ESD-TDR-65-488)
AD-625 016 FLD. 9/5
JA-2590
(ESD-TDR-65-550)
AD-625 017 FLD. 20/12
JA-2325A
(ESD-TDR-65-552)
AD-625 018 FLD. 9/1
JA-2590
(ESD-TDR-65-502)
AD-625 020 FLD. 14/2
JA-2411
(ESD-TDR-65-546)
AD-625 021 FLD. 9/2
TN-1965-15
(ESD-TDR-65-457)
AD-625 375 FLD. 9/5
(ESD-TDR-65-561)
AD-625 567 FLD. 5/8

•AF29(601)-6909
STANFORD RESEARCH INST MENLO PARK CALIF
(WL-TR-65-147)
F AD-625 579 FLD. 20/13

•AF29(601)-6920
MELPAR INC FALLS CHURCH VA
(WL-TR-65-140)
AD-625 458 FLD. 11/2

•AF30(602)-3546 GRANT
INFORMATION SYSTEMS LAB UNIV OF MICHIGAN ANN ARBOR
ISL-65-2
(AFOSR-65-1736)
AD-625 046 FLD. 9/2

•AF30(635)-11188
LENKURT ELECTRIC CO INC SAN CARLOS CALIF
(RADC-TDR-63-440-V2)
F AD-625 549 FLD. 9/5

•AF33(600)-40622

CONTINENTAL AVIATION AND ENGINEERING CORP DETROIT MICH
TN-345
AD-629 079 FLD. 13/7

•AF33(615)-1003
NATIONAL BUREAU OF STANDARDS WASHINGTON D C
NBS-8962
(AFAPL-TR-65-110)
F AD-629 336 FLD. 7/4

•AF33(615)-1078 GRANT
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
AD-629 429 FLD. 20/9

•AF33(615)-1200
SYSTEMS TECHNOLOGY INC HAWTHORNE CALIF
TR-140-1
(AFFDL-TR-65-73)
AD-629 599 FLD. 1/2

•AF33(615)-1485
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
(AFFDL-TR-65-121)
AD-629 888 FLD. 14/2

•AF33(615)-1706
BATTELLE MEMORIAL INST COLUMBUS OHIO
G-6918
(ML-TR-65-289)
S AD-629 128 FLD. 7/3

•AF33(615)-1784
DUNLAP AND ASSOCIATES INC DARIEN CONN
SSD-65-172(514)R
(AMRL-TR-65-168)
F AD-629 041 FLD. 5/10

•AF33(615)-1904
LITTLE (ARTHUR D) INC CAMBRIDGE MASS
(AMRL-TR-65-156)
F AD-629 886 FLD. 6/11

•AF33(615)-2012
ALCOA RESEARCH LABS ALUMINUM CO OF AMERICA NEW KENSINGTON PA
AD-629 459 FLD. 11/6

•AF33(615)-2210
MASSACHUSETTS INST OF TECH CAMBRIDGE ENGINEERING PROJECTS LAB
DSR-9393-1
(AFFDL-TR-65-79)
AD-629 885 FLD. 13/7

•AF33(615)-2215
NEW YORK UNIV N Y
(ARL-65-210)
AD-629 206 FLD. 12/1
(ARL-65-208)
AD-629 207 FLD. 20/4

•AF33(615)-2302
ITT KELLOG COMMUNICATIONS SYSTEMS CHICAGO ILL
(APL-TR-65-113)
F AD-629 587 FLD. 9/3

•AF33(615)-2389
SOUTHWEST RESEARCH INST SAN ANTONIO TEX
(APL-TR-65-118)
AD-629 985 FLD. 11/8

•AF33(615)-2630
BAUSCH AND LOMB INC ROCHESTER N Y
B/L-8926-IR-1
AD-629 319 FLD. 13/7

•AF33(615)-3108
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
AD-629 382 FLD. 17/2

•AF33(616)-8493
CINCINNATI UNIV OHIO DEPT OF AEROSPACE ENGINEERING
TR-AE-6505
AD-629 098 FLD. 20/13
CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF
(ARL-65-183)
F AD-629 205 FLD. 20/4
(ARL-65-212)
AD-629 384 FLD. 20/4
(ARL-65-182)
AD-629 404 FLD. 20/4

•AF33(657)-1498
ISOMET CORP PALISADES PARK N J
(AMRL-TR-65-153)
F AD-629 482 FLD. 6/11

•AF33(657)-8317
BROWN UNIV PROVIDENCE R I METALS RESEARCH LAB
(ARL-65-123)
F AD-629 476 FLD. 20/12

•AF33(657)-8859
OKLAHOMA UNIV NORMAN SCHOOL OF AEROSPACE AND MECHANICAL ENGINEERING
(ARL-65-211)
AD-629 209 FLD. 20/13

•AF33(657)-8975
DAYTON UNIV OHIO RESEARCH INST
(ARL-65-181)
F AD-629 570 FLD. 7/1

•AF33(657)-11198
NATIONAL OPINION RESEARCH CENTER NEW YORK
101-PT-2
(AMRL-TR-65-37-VOL-2)
F AD-629 332 FLD. 1/3

•AF33(657)-11398
WISCONSIN ALUMNI RESEARCH FOUNDATION MADISON
(ARL-TR-65-11)
F AD-629 101 FLD. 6/3

•AF33(657)-12373
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
TR-65-99
AD-629 460 FLD. 8/11
TR-65-128
AD-629 461 FLD. 8/11
GEOTECHNICAL CORP GARLAND TEX
TR-65-98
F AD-629 916 FLD. 8/11

•AF33(657)-12497
UED EARTH SCIENCES DIV TELEDYNE INC ALEXANDRIA VA
AD-629 947 FLD. 8/11

•AF33(657)-12497 ARPA
UED EARTH SCIENCES DIV TELEDYNE INC ALEXANDRIA VA
AD-629 548 FLD. 8/11

•AF33(657)-12747 ARPA
TEXAS INSTRUMENTS INC DALLAS
AD-629 556 FLD. 8/11

•AF33(657)-13962
GEOTECHNICAL CORP GARLAND TEX
TR-65-92
AD-629 462 FLD. 8/11

•AF33(657)-13968
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
TR-65-112
AD-629 514 FLD. 8/11

•AF33(657)-13909
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
AD-629 491 FLD. 8/11

•AF33(657)-13909 ARPA
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
AD-629 555 FLD. 8/11
F AD-629 607 FLD. 8/11

•AF33(657)-14444
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
TR-65-129
AD-629 469 FLD. 8/11
GEOTECHNICAL CORP GARLAND TEX
TR-65-96
AD-629 467 FLD. 8/11

•AF33(657)-14698
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
AD-629 552 FLD. 8/11

•AF33(657)-14698 ARPA
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
AD-629 553 FLD. 8/11

•AF33(657)-15288
GEOTECHNICAL CORP GARLAND TEX
TR-65-120
AD-629 518 FLD. 8/11

•AF49(638)-284
CALIFORNIA UNIV RIVERSIDE DEPT OF CHEMISTRY
(AFOSR-64-1758)
F AD-629 455 FLD. 20/13

•AF49(638)-357 GRANT
WESTERN RESERVE UNIV CLEVELAND OHIO CENTER FOR DOCUMENTATION AND COMMUNICATION RESEARCH
(AFOSR-65-1520)
AD-629 977 FLD. 5/2

•AF49(638)-478
CARNEGIE INST OF TECH PITTSBURGH PA METALS RESEARCH LAB
(AFOSR-65-1843)
F AD-629 371 FLD. 11/6

•AF49(638)-700
RAND CORP SANTA MONICA CALIF
RM-4818-PR
AD-629 011 FLD. 9/1
RM-4747-PR
AD-629 239 FLD. 9/1
RM-4763-PR
AD-629 268 FLD. 20/9
RM-4284-PR
AD-629 407 FLD. 21/4

•AF49(638)-788 GRANT
PITTSBURGH UNIV PA
(AFOSR-65-1729)
AD-629 414 FLD. 7/3

•AF49(638)-1059
STANFORD UNIV CALIF RADIO ASTRONOMY INST
REPRINT-R-31
(AFOSR-65-2259)
AD-629 366 FLD. 3/2

•AF49(638)-1091
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
IITRI-C206-13
(AFOSR-65-1731)
F AD-629 077 FLD. 7/2

•AF49(638)-1121
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
(AFOSR-65-2260)
AD-629 363 FLD. 20/13

•AF49(638)-1128
BUNKER-RAMO CORP CANOGA PARK CALIF
(AFOSR-65-2263)
AD-629 369 FLD. 9/2

•AF49(638)-1138
AEROCHEM RESEARCH LABS INC
PRINCETON N J
(AFOSR-69-2266)
AD-629 367 FLD. 20/13

•AF49(638)-1208
ROCKETDYNE CANOGA PARK CALIF
R-6213
(AFOSR-69-1733)
AD-624 999 FLD. 21/9

•AF49(638)-1272
STANFORD UNIV CALIF
(AFOSR-69-1793)
F AD-629 080 FLD. 7/3

•AF49(638)-1276
STANFORD UNIV CALIF DEPT OF
AERONAUTICS AND ASTRONAUTICS
SUDAER-227
(AFOSR-69-1588)
AD-629 279 FLD. 20/11
SUDAER-231
(AFOSR-69-1987)
AD-629 276 FLD. 20/11

•AF49(638)-1291
ILLINOIS UNIV URBANA DEPT OF
PSYCHOLOGY
TR-3
(AFOSR-69-1597)
AD-629 387 FLD. 5/10
TR-4
(AFOSR-69-1958)
AD-629 487 FLD. 5/10

•AF49(638)-1402
POLYTECHNIC INST OF BROOKLYN N Y
MICROWAVE RESEARCH INST
PIBMRI-1299-65
AD-629 492 FLD. 9/1

•AF49(638)-1528
MASSACHUSETTS INST OF TECH
CAMBRIDGE AEROELASTIC AND
STRUCTURES RESEARCH LAB
ASRL-TR-134-1
(AFOSR-69-1907)
AD-624 998 FLD. 20/11

•AF49(638)-1561
FEDERATION OF AMERICAN SOCIETIES
FOR EXPERIMENTAL BIOLOGY
WASHINGTON D C
(AFOSR-69-1891)
AD-629 498 FLD. 5/2

•AF49(638)-1577
AERONUTRONIC DIV PHILCO CORP
NEWPORT BEACH CALIF
QLR-69-14
AD-629 044 FLD. 21/2

•AF49(638)-1599
ANAGRAM CORP SPRINGFIELD VA
AF(ANAGRAM)-1599
F AD-629 383 FLD. 9/2

•AF49(638)-1700
RAND CORP SANTA MONICA CALIF
RM-4792-PR
AD-629 409 FLD. 5/2

•AF61(052)-495
CLARENDON LAB UNIV OF OXFORD
(ENGLAND)
(AFML-TR-69-419)
F AD-629 043 FLD. 20/9

•AF-61(052)-701
UPPSALA UNIV (SWEDEN) QUANTUM
CHEMISTRY GROUP
SCIENTIFIC-27
(ARL-69-249)
AD-629 212 FLD. 7/4
SCIENTIFIC-33
(ARL-69-250)
AD-629 213 FLD. 7/4
SCIENTIFIC-34
(ARL-69-251)
AD-629 214 FLD. 7/4
SCIENTIFIC-16
(ARL-69-248)
AD-629 369 FLD. 20/10
SCIENTIFIC-37
(ARL-69-252)
AD-629 377 FLD. 7/4
SCIENTIFIC-38
(ARL-69-257)
AD-629 398 FLD. 20/8
SCIENTIFIC-42
(ARL-69-258)
AD-629 412 FLD. 12/1

•AF61(052)-701 GRANT
UPPSALA UNIV (SWEDEN) QUANTUM
CHEMISTRY GROUP
SCIENTIFIC-28 SCIENTIFIC-29
(ARL-69-256)
AD-629 411 FLD. 7/4

•AF61(052)-824
TECHNION - ISRAEL INST OF TECH
HAIFA DEPT OF CHEMISTRY
(AFML-69-420)
F AD-629 049 FLD. 7/2

•AF(628)-379
NEW YORK UNIV N Y LAB FOR
ELECTROSCIENCE RESEARCH
SCIENTIFIC-22
(AFCRL-69-803)
AD-629 392 FLD. 9/5

•AF-AFOSR-7-64
ILLINOIS UNIV URBANA ELECTRICAL
ENGINEERING RESEARCH LAB
TR-5
(AFOSR-69-1713)
AD-624 864 FLD. 6/4

•AF-AFOSR-23-63
TEXAS TECHNOLOGICAL COLL LUBBOCK
DEPT OF CHEMISTRY
(AFOSR-69-2394)
AD-629 389 FLD. 7/4
(AFOSR-69-2393)
AD-629 390 FLD. 7/3
(AFOSR-69-2391)
AD-629 392 FLD. 7/3
(AFOSR-69-2392)
AD-629 393 FLD. 7/3

•AF-AFOSR-62-196
RESEARCH INST TEMPLE UNIV
PHILADELPHIA PA
(AFOSR-69-1802)
F AD-629 391 FLD. 20/9

•AF-AFOSR-69-63
ILLINOIS UNIV URBANA GROUP
EFFECTIVENESS RESEARCH LAB
(AFOSR-69-2174)
AD-629 988 FLD. 5/10

•AF-AFOSR-130-63
CALIFORNIA UNIV BERKELEY DEPT OF
PHYSICS
(AFOSR-69-2190)
AD-629 594 FLD. 20/10
(AFOSR-69-2192)
AD-629 596 FLD. 20/8
(AFOSR-69-2191)
AD-629 597 FLD. 20/10

•AF-AFOSR-139-63
CALIFORNIA UNIV BERKELEY
ELECTRONICS RESEARCH LAB
(AFOSR-69-2194)
AD-629 983 FLD. 9/1

•AF-AFOSR-139-64
CALIFORNIA UNIV BERKELEY
ELECTRONICS RESEARCH LAB
(AFOSR-69-2444)
AD-629 576 FLD. 9/5

•AF-AFOSR-139-65
CALIFORNIA UNIV BERKELEY
ELECTRONICS RESEARCH LAB
AD-629 424 FLD. 20/9

•AF-AFOSR-141-63
MARYLAND UNIV COLLEGE PARK INST
FOR FLUID DYNAMICS AND APPLIED
MATHEMATICS
BN-411
AD-629 039 FLD. 20/9

•AF-AFOSR-157-63
FRICK CHEMICAL LAB PRINCETON UNIV
N J
(AFOSR-69-2198)
AD-629 541 FLD. 11/9

•AF-AFOSR-171-63
CALIFORNIA UNIV BERKELEY DEPT OF
ASTRONOMY
299
(AFOSR-69-2199)
AD-629 939 FLD. 3/2

•AF-AFOSR-181-63
RENSSELAER POLYTECHNIC INST TROY N
Y DEPT OF CHEMISTRY
(AFOSR-69-2200)
AD-629 936 FLD. 7/4

•AF-AFOSR-183-63
YALE UNIV NEW HAVEN CONN DEPT OF
CHEMISTRY
(AFOSR-69-2202)
AD-629 937 FLD. 8/1

•AF-AFOSR-192-63
MICHIGAN UNIV ANN ARBOR
(AFOSR-69-2203)
AD-629 942 FLD. 5/10

•AF-AFOSR-196-63
PITTSBURGH UNIV PA
(AFOSR-69-2204)
AD-629 946 FLD. 20/2

•AF-AFOSR-200-63
MINNESOTA UNIV MINNEAPOLIS DEPT
OF CHEMISTRY
(AFOSR-69-1762)
AD-629 550 FLD. 20/12
MINNESOTA UNIV MINNEAPOLIS DIV OF
PHYSICAL CHEMISTRY
(AFOSR-69-1761)
AD-629 548 FLD. 20/8

•AF-AFOSR-203-63
OHIO STATE UNIV COLUMBUS ROCKET
RESEARCH LAB
(AFOSR-69-2205)
AD-629 489 FLD. 19/4

•AF-AFOSR-219-63
MINNESOTA UNIV MINNEAPOLIS
(AFOSR-69-2208)
AD-629 551 FLD. 4/1

•AF-AFOSR-221-63
WISCONSIN UNIV MADISON
(AFOSR-69-1903)
AD-629 594 FLD. 11/6

•AF-AFOSR-232-63
CALIFORNIA UNIV BERKELEY DEPT OF
PHYSICS
(AFOSR-69-1823)
AD-629 562 FLD. 20/10

•AF-AFOSR-232-64
CALIFORNIA UNIV BERKELEY DEPT OF
PHYSICS
(AFOSR-69-1815)
AD-629 573 FLD. 20/8

•AF-AFOSR-305-63
FALKINER NUCLEAR DEPT UNIV OF
SYDNEY (AUSTRALIA)
(AFOSR-69-1811)
AD-629 564 FLD. 20/8

•AF-AFOSR-349-63
PITTSBURGH UNIV PA
(AFOSR-69-1729)
AD-629 414 FLD. 7/3
PITTSBURGH UNIV PA DEPT OF

CHEMISTRY
AD-629 039 FLD. 7/3

•AF-AFOSR-367-64
INFORMATION SYSTEMS LAB UNIV OF MICHIGAN ANN ARBOR
ISL-69-2
(AFOSR-69-1736)
AD-629 046 FLD. 9/2

•AF-AFOSR-368-63
BRANDEIS UNIV WALTHAM MASS DEPT OF PHYSICS
(AFOSR-69-1787)
AD-629 563 FLD. 20/8

•AF-AFOSR-385-63
BOSTON UNIV MASS DEPT OF PHYSICS
(AFOSR-69-1799)
AD-629 557 FLD. 12/1
(AFOSR-69-1813)
AD-629 559 FLD. 20/8
(AFOSR-69-1814)
AD-629 561 FLD. 20/8

•AF-AFOSR-403-63
WESTERN RESERVE UNIV CLEVELAND OHIO CENTER FOR DOCUMENTATION AND COMMUNICATION RESEARCH
(AFOSR-69-1920)
AD-629 577 FLD. 5/2

•AF-AFOSR-425-63
SYRACUSE UNIV N Y
(AFOSR-69-1909)
AD-629 578 FLD. 20/12

•AF-AFOSR-800-64
MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
(AFOSR-69-1817)
AD-629 569 FLD. 20/8
(AFOSR-69-1776)
AD-629 571 FLD. 20/10
(AFOSR-69-1818)
AD-629 572 FLD. 20/10

•AF-AFOSR-821-64
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL
(AFOSR-69-1820)
AD-629 600 FLD. 4/1

•AF-AFOSR-829-64
NORTHWESTERN UNIV EVANSTON ILL DEPT OF CHEMISTRY
(AFOSR-69-1671)
AD-629 602 FLD. 7/4

•AF-AFOSR-871-64
TUFTS UNIV MEDFORD MASS DEPT OF BIOLOGY
(AFOSR-69-2223)
AD-629 034 FLD. 6/3

•AF-AFOSR-716-65
COMISION NACIONAL DE INVESTIGACIONES ESPACIALES BUENOS AIRES (ARGENTINA)
CNIE-PE-2
(AFOSR-69-1730)
AD-629 036 FLD. 4/1

•AF-AFOSR-931-65
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
R-270
AD-629 200 FLD. 9/1
R-272
AD-629 201 FLD. 9/1

•AF-EOAR-44-63
INSTITUTO NACIONAL DE TECHNICA AEROESPACIAL MADRID (SPAIN)
(AFOSR-69-1791)
F AD-629 015 FLD. 21/2

•AF-EOAR-47-63
LABORATOIRE DE PHYSIQUE THEORIQUE ET HAUTES ENERGIES ORSAY (FRANCE)
(AFOSR-69-1796)
AD-629 398 FLD. 12/1

•AF-EOAR-61-22
FREIE UNIVERSITAET BERLIN (WEST GERMANY) INSTITUT FUER THEORETISCHE PHYSIK
(AFOSR-69-1684)
F AD-629 900 FLD. 20/8

•AF-EOAR-62-1
BIRMINGHAM UNIV (ENGLAND) DEPT OF CHEMISTRY
SCIENTIFIC-3
(AFOSR-69-1687)
AD-629 497 FLD. 7/4

•AF-EOAR-62-58
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
(NL-TDR-64-135)
S AD-629 988 FLD. 7/2

•AF-EOAR-62-67
LYON UNIV (FRANCE) LABORATOIRE DE PATHOLOGIE EXPERIMENTALE
(AFOSR-69-2292)
AD-629 342 FLD. 6/16

•AF-EOAR-63-64
CAMBRIDGE LANGUAGE RESEARCH UNIT (ENGLAND)
(AFOSR-69-1883)
F AD-629 988 FLD. 12/1

•AF-EOAR-63-79
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
(AFOSR-69-2183)
AD-629 358 FLD. 20/8

•AF-EOAR-63-110
KIEL UNIV (WEST GERMANY) INSTITUT FUER EXPERIMENTELLE PHYSIK
(AFML-TR-69-917)
F AD-629 999 FLD. 7/4

•AF-EOAR-69-2
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF BOTANY
(AFOSR-69-2649)
F AD-629 999 FLD. 6/1

•AF-EOAR-79-63
CAMBRIDGE UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS
(AFOSR-69-1782)
AD-629 397 FLD. 20/10

•AF-EOAR-98-63
POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA
TN-30
(AFOSR-69-2187)
AD-629 361 FLD. 20/4

•AF-EOAR-100-63
OSLO UNIV (NORWAY)
(CERN-69-61)
AD-629 014 FLD. 18/8

•AF-EOAR-101-63
SHEFFIELD UNIV (ENGLAND) DEPT OF FUEL TECHNOLOGY AND CHEMICAL ENGINEERING
HIC-99
(AFOSR-69-1804)
F AD-629 999 FLD. 21/8

•ARPA ORDER-104
GEOTECHNICAL CORP GARLAND TEX
TR-65-92
AD-629 962 FLD. 8/11
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
AD-629 991 FLD. 8/11

•ARPA ORDER-104-60
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
TR-65-112
AD-629 514 FLD. 8/11
GEOTECHNICAL CORP GARLAND TEX
TR-65-58
F AD-629 516 FLD. 8/11

•ARPA ORDER-189-61
RAND CORP SANTA MONICA CALIF
RM-4741-ARPA
AD-629 074 FLD. 18/3

•ARPA ORDER-215
COLORADO UNIV BOULDER
AD-629 538 FLD. 3/2

•ARPA ORDER-237
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF
GD/C-DBE-65-028
AD-629 982 FLD. 21/2

•ARPA ORDER-292
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
703
(AFCRL-65-792)
AD-629 308 FLD. 8/7

•ARPA ORDER-400
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
TR-3-703
F AD-629 390 FLD. 13/6

•ARPA ORDER-402
AMERICAN OIL CO WHITING IND RESEARCH AND DEVELOPMENT DEPT
M65-265
AD-629 928 FLD. 7/2

•ARPA ORDER-629
GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX
TR-65-99
AD-629 460 FLD. 8/11
TR-65-128
AD-629 461 FLD. 8/11
TR-65-129
AD-629 469 FLD. 8/11
TR-65-119
AD-629 515 FLD. 8/11
GEOTECHNICAL CORP GARLAND TEX
TR-65-96
AD-629 467 FLD. 8/11
TR-65-120
AD-629 518 FLD. 8/11
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
AD-629 552 FLD. 8/11
UED EARTH SCIENCES DIV TELEDYNE INC ALEXANDRIA VA
AD-629 547 FLD. 8/11

•ARPA ORDER-691
LINCOLN LAB MASS INST OF TECH LEXINGTON
(ESD-TDR-65-961)
AD-629 567 FLD. 5/8

•AT(30-1)-1800 GRANT
TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS
AD-629 523 FLD. 6/16

•DA-01-021-AMC-12346(Z)
AUBURN UNIV ALA
AD-629 191 FLD. 7/2

•DA-04-200-ORD-1279
STANFORD RESEARCH INST MENLO PARK CALIF
F AD-629 568 FLD. 20/11

•DA-19-020-AMC-9443(X)
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METALLURGY
(AMRA-CR64-04/3)
AD-629 987 FLD. 11/6

•DA-19-129-AMC-79(N)
FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY
AD-629 867 FLD. 11/10

•DA-19-129-AMC-99(N)
ARMY NATICK LABS MASS
F AD-629 999 FLD. 6/8

•DA-19-129-AMC-130(N)
MIDWEST RESEARCH INST KANSAS CITY MO
AD-629 869 FLD. 6/8

•DA-19-129-AMC-131
WHIRLPOOL CORP ST JOSEPH MICH SYSTEMS DIV
F AD-629 989 FLD. 6/8

•DA-19-129-QM-1984
NEW YORK STATE AGRICULTURAL EXPERIMENT STATION GENEVA
F AD-629 983 FLD. 6/8

•DA-19-129-QM-2008
SWIFT AND CO CHICAGO ILL
AD-629 292 FLD. 6/8

•DA-23-072-AMC-168(Z)
PLASMA LAB UNIV OF ARKANSAS FAYETTEVILLE
UAPL-24
F AD-629 575 FLD. 10/2

•DA-28-043-AMC-00040(E)
FAIRCHILD SEMICONDUCTOR RESEARCH AND DEVELOPMENT LABS PALO ALTO CALIF
F AD-629 933 FLD. 9/1

•DA-28-043-AMC-00073GRANT
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
R-270
AD-629 200 FLD. 9/1
R-272
AD-629 201 FLD. 9/1

•DA-28-043-AMC-00240(E)
RADIATION RESEARCH ASSOCIATES INC FORT WORTH TEX
RRA-T59-1
(ECOM-00240-F-VOL-1)
F AD-629 115 FLD. 20/6
RRA-T59-2
(ECOM-00240-F-VOL-2)
F AD-629 116 FLD. 20/6

•DA-28-043-AMC-00384(E)
TECHNOLOGY INC DAYTON OHIO
AD-629 339 FLD. 9/2

•DA-28-043-AMC-00418(E)
HUGHES AIRCRAFT CO NEWPORT BEACH CALIF MICROELECTRONICS DIV
AD-629 533 FLD. 9/1

•DA-28-043-AMC-00423(E)
HORTRONICS NEWBURY PARK CALIF APPLIED RESEARCH DEPT
NVR-3920
(ECOM-00423-2)
AD-629 341 FLD. 18/8

•DA-28-043-AMC-01232(E)
ELECTRO TECHNICAL ANALYSIS CORP TUCSON ARIZ
AD-629 589 FLD. 17/2.1

•DA-28-043-AMC-01286(E)
ENGELHARD INDUSTRIES INC NEWARK N J RESEARCH AND DEVELOPMENT DIV
AD-629 127 FLD. 10/2

•DA-28-043-AMC-01381(E)
SCIENTIFIC-ATLANTA INC GA
AD-629 209 FLD. 9/5

•DA-28-043-AMC-01385(E)
RADIO CORP OF AMERICA NEW YORK DEFENSE ELECTRONIC PRODUCTS
CR-69-919-17
AD-629 310 FLD. 9/5

•DA-28-043-AMC-01428(E)
DELCO RADIO DIV GENERAL MOTORS CORP KOKOMO IND
AD-629 868 FLD. 9/1

•DA-28-043-AMC-10387(E)
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
AD-629 329 FLD. 9/1

•DA-31-124-ARO(D)-78
AMERICAN OIL CO WHITING IND RESEARCH AND DEVELOPMENT DEPT
M69-269
AD-629 928 FLD. 7/2

•DA-31-124-ARO(D)-331
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
ORC-69-23
AD-629 369 FLD. 12/2

•DA-36-038-AMC-1729(A)
FOOTE MINERAL CO BERWYN PA
(FA-R-1778)
AD-629 879 FLD. 11/2

•DA-36-039-AMC-00027(E)
MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB
05361-12-S
AD-629 938 FLD. 9/1

•DA-36-039-AMC-00039(E)
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
EERL-96
AD-629 983 FLD. 9/3

•DA-36-039-AMC-03200(E)
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-629 879 FLD. 20/9

•DA-36-039-AMC-03623(E)
MALLORY (P R) AND CO INC INDIANAPOLIS IND
AD-629 584 FLD. 9/1

•DA-36-039-AMC-03628(E)
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP WINDSOR LOCKS CONN
AD-629 479 FLD. 13/8

•DA-36-039-AMC-06156(E)
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
AD-629 317 FLD. 9/1

•DA-36-039-SC-78801 GRANT
MICHIGAN UNIV ANN ARBOR
(AFOSR-69-2203)
AD-629 942 FLD. 9/10

•DA-36-039-SC-89967
ITT ELECTRON TUBE DIV ROANOKE VA
3235A
AD-629 190 FLD. 9/1

•DA-36-039-SC-89977
INTERNATIONAL RECTIFIER CORP LOS ANGELES CALIF
AD-629 929 FLD. 9/1

•DA-36-039-SC-86737
LEWIS (E B) CO INC EAST HARTFORD CONN
AD-629 202 FLD. 9/1

•DA-36-039-SC-90789
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
REF-69-56
AD-629 180 FLD. 9/2

•DA-49-009-AMC-691(X)
PURDUE UNIV LAFAYETTE IND
F AD-629 217 FLD. 9/10

•DA-49-177-AMC-77(T)
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
CAL-BB-1890-S-1
(USAAVLABS-TR-69-69)
F AD-629 860 FLD. 1/1

•DA-49-188-ARO-1
RESEARCH ANALYSIS CORP MCLEAN VA
RAC-TP-160
AD-629 047 FLD. 12/2
RAC-TP-143
AD-629 048 FLD. 12/1

•DA-49-092-ARO-33
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
AD-629 926 FLD. 8/6

•DA-49-146-XZ-384
GENERAL ATOMIC SAN DIEGO CALIF
JOHN JAY HOPKINS LAB FOR PURE AND APPLIED SCIENCE
GA-6699
(DASA-1708)
S AD-629 980 FLD. 9/1

•DA-49-193-MD-2060 GRANT
ILLINOIS UNIV URBANA GROUP EFFECTIVENESS RESEARCH LAB
(AFOSR-69-2179)
AD-629 588 FLD. 9/10

•DA-49-193-MD-2238
MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
AD-629 100 FLD. 6/3
AD-629 274 FLD. 6/3

•DA-91-591-EUC-2179
DEUTSCHER WETTERDIENST OFFENBACH AM MAIN (WEST GERMANY)
AD-629 216 FLD. 9/2

•DA-92-557-FEC-37370
KUMAMOTO UNIV (JAPAN) MEDICAL SCHOOL
(ARDG(FE)-J-196)
F AD-629 889 FLD. 6/1

•DA-ARO(D)-31-124-G988
TEXAS UNIV AUSTIN
(AROD-3772:9)
AD-629 694 FLD. 12/1

•DA-ARO-49-092-63-620
COMISION NACIONAL DE ENERGIA ATOMICA BUENOS AIRES (ARGENTINA) DEPARTAMENTO DE METALURGIA
F AD-629 479 FLD. 11/6

•DA-ARO-49-092-64-644
COMISION NACIONAL DE ENERGIA ATOMICA BUENOS AIRES (ARGENTINA) DEPARTAMENTO DE METALURGIA
F AD-629 479 FLD. 11/6

•DA-ARO-49-092-64-660
INSTITUTO VENEZOLANO DE INVESTIGACIONES CIENTIFICAS CARACAS DEPARTAMENTO DE PATOLOGIA EXPERIMENTAL
A AD-629 479 FLD. 6/1

•DA-ARO-49-092-69-679
MCGILL UNIV MONTREAL (QUEBEC) DEPT OF GEOGRAPHY
AD-629 927 FLD. 8/6

•DA-ARO(D)-31-124-694
NORTH CAROLINA STATE UNIV RALEIGH DEPT OF ENGINEERING RESEARCH
(AROD-3138:8)
F AD-629 028 FLD. 11/6

•DA-ARO(D)-31-124-G112
MINNESOTA UNIV MINNEAPOLIS
(AROD-3153:1)
F AD-629 879 FLD. 7/3

•DA-ARO(D)-31-124-6223
NORTHWESTERN UNIV EVANSTON ILL
DEPT OF ELECTRICAL ENGINEERING
(AROD-3298:22)
AD-629 652 FLD. 14/4

•DA-ARO(D)-31-124-6242
MORLEY CHEMICAL LAB WESTERN RESERVE
UNIV CLEVELAND OHIO
(AROD-3342:8)
AD-629 648 FLD. 7/3
(AROD-3342:6)
AD-629 649 FLD. 7/3
(AROD-3342:9)
AD-629 650 FLD. 7/3

•DA-ARO(D)-31-124-6328
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF CHEMISTRY
(AROD-3616:9)
AD-629 639 FLD. 7/4
(AROD-3616:8)
AD-629 643 FLD. 7/4
(AROD-3616:7)
AD-629 646 FLD. 7/4

•DA-ARO(D)-31-124-6392
EVANS CHEMICAL LAB OHIO STATE UNIV
COLUMBUS
(AROD-3631:4)
AD-629 636 FLD. 7/3
(AROD-3631:3)
AD-629 637 FLD. 7/3
(AROD-3631:2)
AD-629 638 FLD. 7/3
OHIO STATE UNIV RESEARCH FOUNDATION
COLUMBUS
(AROD-3631:1)
F AD-629 218 FLD. 7/3

•DA-ARO(D)-31-124-6409
DUKE UNIV DURHAM N C DEPT OF
CHEMISTRY
(AROD-3581:10)
AD-629 634 FLD. 7/3
(AROD-3581:9)
AD-629 635 FLD. 7/3

•DA-ARO(D)-31-124-6423
LOUISIANA STATE UNIV BATON ROUGE
(AROD-4016:3)
AD-629 696 FLD. 20/4

•DA-ORD-31-124-61-695
JOHNS HOPKINS UNIV BALTIMORE MD
AD-629 477 FLD. 12/1

•DRB-2801-16
ALBERTA UNIV CALGARY DEPT OF
PHYSICS
AD-629 083 FLD. 14/2
AD-629 108 FLD. 3/2

•DRB-9310-32
TORONTO UNIV (ONTARIO) DEPT OF
PHYSIOLOGY
AD-629 920 FLD. 6/16

•DRB-9350-14
TORONTO UNIV (ONTARIO) DEPT OF
MEDICAL BIOPHYSICS
AD-629 902 FLD. 6/18

•DRB-9401-11
MCGILL UNIV MONTREAL (QUEBEC)
AD-629 106 FLD. 9/10
AD-629 107 FLD. 9/10

•DRB-9425-08
MANITOBA UNIV WINNIPEG
AD-629 928 FLD. 6/16

•MA-1920
TORONTO UNIV (ONTARIO) DEPT OF
MEDICAL BIOPHYSICS
AD-629 902 FLD. 6/18

•N70NR-321(02)
STANFORD RESEARCH INST MENLO PARK
CALIF
TR-5
AD-629 344 FLD. 11/11
TR-6
AD-629 345 FLD. 11/11
SRI-TR-4
AD-629 346 FLD. 11/11

•N123(60930)32897A
CALIFORNIA UNIV LOS ANGELES DEPT
OF ENGINEERING
UCLA-DE-69-53
AD-629 990 FLD. 6/5

•N228(62479)65701
STANFORD RESEARCH INST MENLO PARK
CALIF
F AD-629 173 FLD. 13/12

•N228(62479)65702
STANFORD RESEARCH INST MENLO PARK
CALIF
F AD-629 389 FLD. 6/18

•N600(61533)61992
WESTINGHOUSE ELECTRIC CORP LIMA
OHIO AEROSPACE ELECTRICAL DIV
AD-629 478 FLD. 10/2

•N61339-1950
DUNLAP AND ASSOCIATES INC
WASHINGTON D C
F AD-629 129 FLD. 5/9

•N61339-1979
DUNLAP AND ASSOCIATES INC DARIEN
CONN
AD-629 378 FLD. 5/9

•N62398-4297
STANFORD RESEARCH INST MENLO PARK
CALIF
AD-629 278 FLD. 20/10

•NAS1-3777
LOCKHEED MISSILES AND SPACE CO PALO
ALTO CALIF RESEARCH LABS
AD-629 982 FLD. 22/3

•NASA ORDER-R-97
NAVAL SCHOOL OF AVIATION MEDICINE
PENSACOLA FLA
AD-629 266 FLD. 6/19

•NASA ORDER-R-99
NAVAL SCHOOL OF AVIATION MEDICINE
PENSACOLA FLA
(NAVMED-MR009-13-6001-119)
AD-629 329 FLD. 6/19

•NOBS-90296
UNITED STATES RUBBER CO WAYNE N J
RESEARCH CENTER
AD-629 896 FLD. 11/3

•NOBS-90908
BATTELLE MEMORIAL INST COLUMBUS
OHIO
AD-629 919 FLD. 13/9

•NOBS-92237
CONESCO INC CAMBRIDGE MASS
CONESCO-4841-1
AD-629 389 FLD. 13/10

•NOBS-92269
DOW CHEMICAL CO MIDLAND MICH
SCIENTIFIC PROJECTS LAB
AD-629 209 FLD. 11/8

•NOBSR-91352
TEXAS INSTRUMENTS INC DALLAS
U9-807250-9
F AD-629 916 FLD. 14/2

•NOBSR-93059
LITTLE (ARTHUR D) INC CAMBRIDGE
MASS
9030969
AD-629 237 FLD. 8/10

•NOBSR-93129
DEFENSE RESEARCH LAB UNIV OF TEXAS
AUSTIN
DRL-A-250
AD-629 926 FLD. 14/2

•NOBSR-93306
CHATHAM ELECTRONICS DIV TUNG-SOL
ELECTRIC INC LIVINGSTON N J
AD-629 920 FLD. 9/5

•NOBSR-93320
RADIO CORP OF AMERICA CAMDEN N J
DEFENSE ELECTRONIC PRODUCTS
AD-629 370 FLD. 9/5

•NOBSR-93429
IMAGE INSTRUMENTS INC NEWTON LOWER
FALLS MASS•
AD-629 190 FLD. 13/1

•NONR-220(21)
GRADUATE AERONAUTICAL LABS CALIF
INST OF TECH PASADENA
F AD-629 980 FLD. 20/9

•NONR-220(24)
CALIFORNIA INST OF TECH PASADENA
HYDRODYNAMICS LAB
E-79.9
F AD-629 918 FLD. 10/1

•NONR-220(57)
CALIFORNIA INST OF TECH PASADENA
DIV OF ENGINEERING AND APPLIED
SCIENCE
TR-2
AD-629 908 FLD. 20/11

•NONR-222(45) GRANT
CALIFORNIA UNIV BERKELEY INST OF
ENGINEERING RESEARCH
AS-69-16
AD-629 622 FLD. 20/4

•NONR-222(83)
OPERATIONS RESEARCH CENTER UNIV OF
CALIF BERKELEY
ORC-69-29
AD-629 369 FLD. 12/2

•NONR-222(90)
CALIFORNIA UNIV BERKELEY
AD-629 283 FLD. 9/10

•NONR-225(34)
STANFORD UNIV CALIF DEPT OF
MATERIALS SCIENCE
SU-DMS-69-33
AD-629 029 FLD. 20/2

•NONR-225(92)
STANFORD UNIV CALIF DEPT OF
STATISTICS
TR-112
AD-629 960 FLD. 12/1

•NONR-233(62)
CALIFORNIA UNIV LOS ANGELES DEPT
OF ENGINEERING
69-48
AD-629 084 FLD. 20/14
69-46
AD-629 085 FLD. 20/4
69-50
AD-629 086 FLD. 20/4
69-49
F AD-629 087 FLD. 20/4
69-45
AD-629 088 FLD. 20/14

•NONR-233(87)
CALIFORNIA UNIV LOS ANGELES DEPT
OF CHEMISTRY
TR-8
AD-629 329 FLD. 11/9
TR-10
AD-629 330 FLD. 11/9
TR-11
AD-629 331 FLD. 11/9

•NONR-233(94)
CALIFORNIA UNIV LOS ANGELES DEPT

OF MEDICAL MICROBIOLOGY AND IMMUNOLOGY
F AD-629 025 FLD. 6/3

•NONR-298(60) GRANT
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MICROBIOLOGY
AD-629 873 FLD. 6/13

•NONR-375(13)
TEXAS UNIV AUSTIN DEPT OF ASTRONOMY
F AD-629 900 FLD. 3/2

•NONR-401(37)
CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS
F AD-629 219 FLD. 20/12

•NONR-404(20)
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF PHYSICS
AD-629 599 FLD. 20/12

•NONR-499(19)
TUFTS UNIV MEDFORD MASS DEPT OF CHEMISTRY
AD-629 604 FLD. 7/4

•NONR-551(49) GRANT
PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY
AD-629 281 FLD. 6/5
AD-629 282 FLD. 6/16

•NONR-582(06) GRANT
AMERICAN MUSEUM OF NATURAL HISTORY NEW YORK DEPT OF ANIMAL BEHAVIOR
AD-629 299 FLD. 6/3

•NONR-562(20)
BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING
TR-44
AD-629 468 FLD. 20/11

•NONR-609(51)
YALE UNIV NEW HAVEN CONN
AD-629 929 FLD. 20/9

•NONR-629(00)
PITTSBURGH UNIV PA DEPT OF PHYSICS
AD-629 313 FLD. 20/8

•NONR-656(20)
PENNSYLVANIA STATE UNIV UNIVERSITY PARK MATERIALS RESEARCH LAB
TR-22
AD-629 428 FLD. 20/12

•NONR-669(18)
SYRACUSE UNIV N Y DEPT OF PHYSICS
TR-3
AD-629 539 FLD. 20/3

•NONR-710(59)
MINNESOTA UNIV DULUTH
AD-629 024 FLD. 7/4

•NONR-1147(07)
COLORADO UNIV BOULDER
TR-17
AD-629 019 FLD. 5/10

•NONR-1147(13)
COLORADO UNIV BOULDER
AD-629 538 FLD. 3/2

•NONR-1181(11)
DUKE UNIV DURHAM N C
A AD-629 422 FLD. 5/10

•NONR-1181(11) GRANT
DUKE UNIV DURHAM N C
AD-629 280 FLD. 5/10

•NONR-1202(17)
WISCONSIN UNIV MADISON DEPT OF STATISTICS
TR-48
AD-629 269 FLD. 12/1
TR-50
AD-629 270 FLD. 12/1
TR-43
AD-629 456 FLD. 12/1

•NONR-1202(17) GRANT
WISCONSIN UNIV MADISON DEPT OF STATISTICS
TR-52
AD-629 269 FLD. 12/1

•NONR-1202 GRANT
WISCONSIN UNIV MADISON DEPT OF STATISTICS
TR-49
AD-629 271 FLD. 12/1

•NONR-1224(19)
MICHIGAN UNIV ANN ARBOR DEPT OF ASTRONOMY
A AD-629 026 FLD. 3/2

•NONR-1228(10)
RESEARCH ANALYSIS CORP MCLEAN VA
RAC-P-12
AD-629 050 FLD. 12/2

•NONR-1834(05)
ILLINOIS UNIV URBANA DEPT OF PHYSICS
A AD-629 210 FLD. 20/8
AD-629 469 FLD. 20/8

•NONR-1834(32)
ILLINOIS UNIV URBANA DEPT OF THEORETICAL AND APPLIED MECHANICS
T/AM-279
AD-629 037 FLD. 20/4

•NONR-1834(39)
ILLINOIS UNIV URBANA DEPT OF PSYCHOLOGY
AD-629 900 FLD. 5/10
AD-629 901 FLD. 5/10

•NONR-1841(92)
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-629 879 FLD. 20/9

•NONR-1841(74)
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF GEOLOGY AND GEOPHYSICS
AD-629 347 FLD. 8/5

•NONR-1858(15)
PRINCETON UNIV N J
RB-69-28
AD-629 403 FLD. 5/10

•NONR-1858(15) GRANT
PRINCETON UNIV N J
RM-69-17
AD-629 479 FLD. 5/10

•NONR-1858(29)
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF FUEL TECHNOLOGY
(AROD-4947:1)
AD-629 179 FLD. 7/4

•NONR-1866(50)
HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND APPLIED PHYSICS
AD-629 421 FLD. 20/2

•NONR-2121(13)
CHICAGO UNIV ILL DEPT OF CHEMISTRY
TR-18
AD-629 211 FLD. 7/4

•NONR-2173(13)
ARIZONA UNIV TUCSON ENGINEERING EXPERIMENT STATION
A AD-629 986 FLD. 18/10

•NONR-2196(00) GRANT
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
WHOI-REF-69-38
AD-629 306 FLD. 14/2

•NONR-2214(00)
PRINCETON UNIV N J
RB-69-28
AD-629 403 FLD. 5/10

•NONR-2216(05)
SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE PHYSICAL LAB
MPL-U-22/69
AD-629 984 FLD. 20/4
MPL-U-62/69
AD-629 985 FLD. 7/4
MPL-U-76/69
AD-629 986 FLD. 20/1

•NONR-2216(11)
CALIFORNIA UNIV SAN DIEGO DEPT OF PHYSICS
TR-36
AD-629 343 FLD. 7/4

•NONR-2216(23)
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-629 947 FLD. 8/5
AD-629 948 FLD. 8/5
AD-629 949 FLD. 8/7
AD-629 950 FLD. 8/10

•NONR-2249(13)
CATHOLIC UNIV OF AMERICA WASHINGTON D C DIV OF NUCLEAR SCIENCE AND ENGINEERING
AD-629 906 FLD. 18/2
A AD-629 919 FLD. 18/2

•NONR-2587(09) GRANT
MICHIGAN STATE UNIV EAST LANSING DEPT OF STATISTICS
MSU-RM-147
AD-629 898 FLD. 8/8
RM-149
AD-629 899 FLD. 12/1

•NONR-2907(00)
RESEARCH FOUNDATION FOR MENTAL HYGIENE NEW YORK
F AD-629 994 FLD. 6/16

•NONR-3902(01)
LOYOLA UNIV CHICAGO ILL DEPT OF PHYSIOLOGY
AD-629 279 FLD. 6/5

•NONR-3911(00)
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
TR-14(60)
AD-629 540 FLD. 7/4

•NONR-3656(26) GRANT
CALIFORNIA UNIV BERKELEY SPACE SCIENCES LAB
SSL(UC)-6-90
AD-629 178 FLD. 3/2

•NONR-3730(00)
MECHANICAL TECHNOLOGY INC LATHAM N Y
MTI-69TR37
AD-629 429 FLD. 13/9

•NONR-3893(00)
GENERAL ELECTRIC CO SCHENECTADY N Y RESEARCH AND DEVELOPMENT CENTER
F AD-629 986 FLD. 20/3

•NONR-3902(00)
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF
GD/C-DBE-69-028
AD-629 982 FLD. 21/2

•NONR-3977(00)
MONSANTO RESEARCH CORP DAYTON OHIO

AD-629 307 FLD. 7/2

•NONR-4010(09)
JOHNS HOPKINS UNIV BALTIMORE MD
DEPT OF STATISTICS
TR-39
AD-629 272 FLD. 12/1

•NONR-4010(13)
JOHNS HOPKINS UNIV BALTIMORE MD
DEPT OF STATISTICS
TR-39
AD-629 272 FLD. 12/1

•NONR-4029(00) GRANT
WOODS HOLE OCEANOGRAPHIC
INSTITUTION MASS
TR-1-69
AD-629 999 FLD. 8/10

•NONR-4099(00)
GEOSCIENCE LTD LA JOLLA CALIF
GLR-90
AD-629 897 FLD. 6/3

•NONR-4102(01)
MASSACHUSETTS INST OF TECH
CAMBRIDGE
MAC-TR-21
AD-629 993 FLD. 9/2

•NONR-4107(00)
DECO ELECTRONICS INC BOULDER COLO
69-F-1
F AD-629 990 FLD. 17/7

•NONR-4252(01)
EMORY UNIV ATLANTA GA
AD-629 022 FLD. 9/10

•NONR-4259(10)
COLUMBIA RADIATION LAB NEW YORK
TR-2
AD-629 925 FLD. 20/5

•NONR-4294(00)
TEACHERS COLL COLUMBIA UNIV NEW
YORK
AD-629 919 FLD. 9/10
TR-3
AD-629 920 FLD. 9/10
A AD-629 921 FLD. 9/10

•NONR-4294(00) GRANT
TEACHERS COLL COLUMBIA UNIV NEW
YORK
TR-1
AD-629 918 FLD. 9/10

•NONR-4336(00)
DELAWARE UNIV NEWARK DEPT OF
PHYSICS
TR-9
AD-629 273 FLD. 20/3

•NONR-4379(00)
STATE UNIV OF NEW YORK BUFFALO
TR-10
AD-629 992 FLD. 9/10

•NONR-4943(00)
CALIFORNIA UNIV RIVERSIDE
A AD-629 970 FLD. 7/4

•NONR-4969(00)
FRANKLIN INST RESEARCH LABS
PHILADELPHIA PA
F-B2232
F AD-629 376 FLD. 13/9

•NONR-4979(00)
WESTINGHOUSE RESEARCH LABS
PITTSBURGH PA
RR-69-9E2-911-R1
F AD-629 927 FLD. 20/9

•NONR-4977(00)
KORAD CORP SANTA MONICA CALIF
AD-629 338 FLD. 20/5

•NONR(G)-00008-69
YERKES OBSERVATORY WILLIAMS BAY
WIS
F AD-629 993 FLD. 3/2

•NONR(G)-00029-69
ARIZONA UNIV TUCSON LUNAR AND
PLANETARY LAB
AD-629 032 FLD. 3/2

•NONR(G)-00036-69
COLUMBIA UNIV NEW YORK
F AD-629 031 FLD. 6/5

•NONR(G)-00049-62
YALE UNIV NEW HAVEN CONN
F AD-629 899 FLD. 3/2

•NOW-62-0197-T
LTV VOUGHT AERONAUTICS DIV LING-
TEMCO-VOUGHT INC DALLAS TEX
2-53470/3R499
F AD-629 930 FLD. 1/3

•NOW-62-0604-C
JOHNS HOPKINS UNIV SILVER SPRING
MD APPLIED PHYSICS LAB
TG-230-T493
(TT-66-60094)
AD-629 574 FLD. 19/9
TG-230-T461
(TT-66-60097)
AD-629 609 FLD. 14/2

•NOW-62-0728-D
DAVIDSON LAB STEVENS INST OF TECH
HOBOKEN N J
SIT(DL)1031
AD-629 368 FLD. 1/2

•NRC-APT-106
MANITOBA UNIV WINNIPEG
AD-629 928 FLD. 6/16

•NSF-G2370
WOODS HOLE OCEANOGRAPHIC
INSTITUTION MASS
TR-1-69
AD-629 999 FLD. 8/10

•NSF-G7030
JOHNS HOPKINS UNIV BALTIMORE MD
AD-629 977 FLD. 12/1

•NSF-GB-1574
AMERICAN MUSEUM OF NATURAL HISTORY
NEW YORK DEPT OF ANIMAL BEHAVIOR
AD-629 299 FLD. 6/3

•NSF-GB-2997
JOHNS HOPKINS UNIV BALTIMORE MD
DEPT OF MICROBIOLOGY
AD-629 873 FLD. 6/13

•NSF-GB-3402
PRINCETON UNIV N J
RM-69-17
AD-629 979 FLD. 9/10

•NSF-GP-217
TEXAS UNIV AUSTIN
(AROD-3772:9)
AD-629 694 FLD. 12/1

•NSF-GP-700
ILLINOIS UNIV URBANA ELECTRICAL
ENGINEERING RESEARCH LAB
TR-5
(AFOSR-69-1713)
AD-629 869 FLD. 6/9

•NSF-GP-1193
MARYLAND UNIV COLLEGE PARK DEPT
OF PHYSICS AND ASTRONOMY
(AFOSR-69-1776)
AD-629 571 FLD. 20/10

•NSF-GP-2520
CALIFORNIA UNIV BERKELEY INST OF
ENGINEERING RESEARCH
AS-69-16
AD-629 622 FLD. 20/9

•NSF-GP-2914
PENNSYLVANIA STATE UNIV UNIVERSITY
PARK IONOSPHERE RESEARCH LAB
SCIENTIFIC-299
(AFCRL-69-872)
AD-629 609 FLD. 20/14

•NSF-GP-3221
MARYLAND UNIV COLLEGE PARK DEPT
OF PHYSICS AND ASTRONOMY
(AFOSR-69-1818)
AD-629 972 FLD. 20/10

•NSF-GP-3290
WOODS HOLE OCEANOGRAPHIC
INSTITUTION MASS
WHOI-REF-69-58
AD-629 906 FLD. 14/2

•NSF-GS-191
WISCONSIN UNIV MADISON DEPT OF
STATISTICS
TR-99
AD-629 271 FLD. 12/1

•NSF-GS-302
TEACHERS COLL COLUMBIA UNIV NEW
YORK
TR-1
AD-629 918 FLD. 9/10

•NSF-GS-901
EMORY UNIV ATLANTA GA
AD-629 022 FLD. 9/10

•NSF-NSG-912
UPPSALA UNIV (SWEDEN) QUANTUN
CHEMISTRY GROUP
SCIENTIFIC-28 SCIENTIFIC-29
(ARL-69-256)
AD-629 911 FLD. 7/4

•NSG-243-62
CALIFORNIA UNIV BERKELEY SPACE
SCIENCES LAB
SSL(UC)-6-50
AD-629 178 FLD. 3/2

•NSG-279-62
WISCONSIN UNIV MADISON
THEORETICAL CHEMISTRY INST
AD-629 881 FLD. 20/10

•OCD-OS-62-278
PLANNING RESEARCH CORP LOS ANGELES
CALIF
PRC-D-796
F AD-629 172 FLD. 15/3

•OCD-OS-63-184
STANFORD RESEARCH INST MENLO PARK
CALIF
F AD-629 929 FLD. 15/3

•OCD-PS-64-201
SOUTHWEST RESEARCH INST SAN
ANTONIO TEX
F AD-629 936 FLD. 13/1
STANFORD RESEARCH INST MENLO PARK
CALIF
AD-629 238 FLD. 13/13

•OCD-PS-69-7
LIN (T Y) AND ASSOCIATES VAN NUYS
CALIF.
69249
F AD-629 090 FLD. 13/12

•OCD-PS-69-33
DUNLAP AND ASSOCIATES INC DARIEN
CONN
SSD-69-245 (946)
F AD-629 870 FLD. 15/3

•ONR-1-2060-66
PENNSYLVANIA HOSPITAL PHILADELPHIA
DEPT OF MOLECULAR BIOLOGY
AD-629 871 FLD. 6/3

•ORDER-104
TEXAS INSTRUMENTS INC DALLAS

SCIENCE SERVICES DIV
AD-629 558 FLD. 8/11
F AD-629 607 FLD. 8/11

•ORDER-109-60
TEXAS INSTRUMENTS INC DALLAS
AD-629 556 FLD. 8/11

•ORDER-629
TEXAS INSTRUMENTS INC DALLAS
SCIENCE SERVICES DIV
AD-629 557 FLD. 8/11
UED EARTH SCIENCES DIV TELEDYNE INC
ALEXANDRIA VA
AD-629 545 FLD. 8/11

•PHS-6N-6912
DUKE UNIV DURHAM N C
AD-629 280 FLD. 5/10

•PHS-93-69-962
WISCONSIN UNIV MADISON DEPT OF
STATISTICS
TR-92
AD-629 269 FLD. 12/1

•PHS-B-2205
PENNSYLVANIA UNIV PHILADELPHIA
DEPT OF PHYSIOLOGY
AD-629 281 FLD. 6/5

•PHS-CA-09459-06
DUKE UNIV DURHAM N C DEPT OF
CHEMISTRY
(AROD-3581:10)
AD-629 634 FLD. 7/3

•PHS-GM-09608-04
RAND CORP SANTA MONICA CALIF
RM-4979-NIH
AD-629 410 FLD. 6/5

•PHS-GM-11922-01
PENNSYLVANIA HOSPITAL PHILADELPHIA
DEPT OF MOLECULAR BIOLOGY
AD-629 871 FLD. 6/3

•PHS-GM-13138-01
MICHIGAN STATE UNIV EAST LANSING
DEPT OF STATISTICS
MSU-RM-147
AD-629 898 FLD. 8/8
RM-144
AD-629 899 FLD. 12/1

•PHS-HD-0254
TORONTO UNIV (ONTARIO) DEPT OF
MEDICAL BIOPHYSICS
AD-629 923 FLD. 6/16

•PHS-M-2455
MCGILL UNIV MONTREAL (QUEBEC)
AD-629 107 FLD. 5/10

•PHS-SF-277
PENNSYLVANIA UNIV PHILADELPHIA
DEPT OF PHYSIOLOGY
AD-629 282 FLD. 6/16

•PRO-68-909
CENTRAL RADIO PROPAGATION LAB
BOULDER COLO
CRPL-900-11-1000422
(AFCRL-69-435)
AD-629 139 FLD. 20/14

•PRO-569-534
CENTRAL RADIO PROPAGATION LAB
BOULDER COLO
(AFCRL-69-830)
F AD-629 318 FLD. 9/5

•SD-90
INSTITUTE FOR DEFENSE ANALYSES
ARLINGTON VA RESEARCH AND
ENGINEERING SUPPORT DIV
RP-P-210
AD-629 199 FLD. 17/10

•SD-79
RAND CORP SANTA MONICA CALIF
RM-4791-ARPA
AD-629 074 FLD. 18/3
RM-4792-ARPA
AD-629 232 FLD. 17/1

•SD-86
BROWN UNIV PROVIDENCE R I DIV OF
ENGINEERING
TR-44
AD-629 968 FLD. 20/11

•SD-97
SYSTEM DEVELOPMENT CORP SANTA
MONICA CALIF
SP-2279/000/00
AD-629 009 FLD. 9/7

•SD-118
MATERIALS ADVISORY BOARD NAS-NRC
WASHINGTON D C
MAB-206-M(3)
AD-629 049 FLD. 13/8
MAB-216-M SUPERSEDED
AD-629 606 FLD. 14/2

•SD-146
CARNEGIE INST OF TECH PITTSBURGH
PA
AD-629 965 FLD. 9/2

•SD-286
SYSTEM DEVELOPMENT CORP SANTA
MONICA CALIF
TM-2543
AD-629 992 FLD. 5/10

•V1009P-9779
CALIFORNIA UNIV LOS ANGELES DEPT
OF ENGINEERING
UCLA-DE-69-53
AD-629 990 FLD. 6/5

# REPORT NUMBER INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper).


2-53470/3R459
AD-629 930 FLD. 1/3

54-F-1
AD-625 490 FLD. 17/7

65-45
AD-625 088 FLD. 20/14

65-46
AD-625 085 FLD. 20/4

65-48
AD-625 084 FLD. 20/14

65-49
AD-625 087 FLD. 20/4

65-50
AD-625 086 FLD. 20/4

101-PT-2
AD-625 332 FLD. 1/3

192
AD-625 235 FLD. 9/2

295
AD-625 535 FLD. 3/2

703
AD-625 308 FLD. 8/7

989
AD-625 510 FLD. 13/10

1151
AD-625 641 FLD. 6/3

1369
AD-625 645 FLD. 6/13

1375
AD-625 640 FLD. 6/3

1378
AD-625 633 FLD. 6/3

1384
AD-625 644 FLD. 6/3

1388
AD-625 642 FLD. 6/13

3239A
AD-625 190 FLD. 9/1

05361-12-S
AD-625 438 FLD. 9/1

6377-S
AD-625 532 FLD. 11/6

64249
AD-625 040 FLD. 13/12

9030965
AD-625 237 FLD. 8/10

AERDL-1833
AD-625 397 FLD. 7/3

AERDL-RR-1832
AD-625 396 FLD. 19/4

AF(ANAGRAM)-1899
AD-625 383 FLD. 9/2

AFAL-TR-65-251
AD-625 012 FLD. 14/2

AFAL-TR-65-252
AD-625 013 FLD. 20/3

AFAL-TR-65-269
AD-624 989 FLD. 7/2

AFAPL-TR-65-110
AD-625 336 FLD. 7/4

AFCRL-64-1005-P2
AD-625 137 FLD. 4/1

AFCRL-64-1005-PT-1
AD-625 348 FLD. 4/2

AFCRL-68-202
AD-624 887 FLD. 8/2

AFCRL-65-289
AD-624 991 FLD. 20/14

AFCRL-65-415
AD-624 938 FLD. 9/2

AFCRL-65-435
AD-625 139 FLD. 20/14

AFCRL-65-491
AD-625 380 FLD. 17/5

AFCRL-65-579
AD-625 453 FLD. 22/3

AFCRL-65-609
AD-625 457 FLD. 8/14

AFCRL-65-614
AD-625 309 FLD. 4/1

AFCRL-65-629
AD-625 123 FLD. 4/2

AFCRL-65-665
AD-625 315 FLD. 20/1

AFCRL-65-668
AD-625 362 FLD. 20/3

AFCRL-65-677
AD-625 166 FLD. 20/12

AFCRL-65-698
AD-625 138 FLD. 20/8

AFCRL-65-702
AD-625 133 FLD. 20/14

AFCRL-65-704
AD-625 188 FLD. 4/2

AFCRL-65-706
AD-625 171 FLD. 20/9

AFCRL-65-708
AD-625 134 FLD. 3/2

AFCRL-65-720
AD-624 884 FLD. 20/12

AFCRL-65-726
AD-625 170 FLD. 9/5

AFCRL-65-728
AD-625 135 FLD. 19/7

AFCRL-65-736
AD-625 181 FLD. 9/2

AFCRL-65-743
AD-625 132 FLD. 14/2

AFCRL-65-744
AD-625 165 FLD. 8/7

AFCRL-65-745
AD-625 131 FLD. 3/2

AFCRL-65-746
AD-625 124 FLD. 20/6

AFCRL-65-749
AD-625 169 FLD. 20/12

AFCRL-65-755
AD-625 349 FLD. 4/1

AFCRL-65-757
AD-624 880 FLD. 9/5

AFCRL-65-769
AD-625 163 FLD. 17/9

AFCRL-65-784
AD-625 128 FLD. 20/14

AFCRL-65-792
AD-625 308 FLD. 8/7

AFCRL-65-797
AD-624 940 FLD. 9/2

AFCRL-65-802
AD-625 379 FLD. 9/1

AFCRL-65-803
AD-625 392 FLD. 9/5

AFCRL-65-805
AD-625 081 FLD. 12/1

AFCRL-65-806
AD-624 939 FLD. 9/2

AFCRL-65-808
AD-625 122 FLD. 20/14

AFCRL-65-809
AD-625 164 FLD. 17/9

AFCRL-65-810
AD-625 121 FLD. 7/3

AFCRL-65-815
AD-625 451 FLD. 7/4

AFCRL-65-830
AD-625 318 FLD. 9/5

AFCRL-65-841
AD-625 381 FLD. 3/2

AFCRL-65-842
AD-625 082 FLD. 20/9

AFCRL-65-849
AD-625 481 FLD. 4/2

AFCRL-65-872
AD-625 609 FLD. 20/14

AFCRL-6670
AD-625 337 FLD. 20/6

AFFDL-TR-65-73
AD-625 599 FLD. 1/2

AFFDL-TR-65-79
AD-624 885 FLD. 13/7

AFFDL-TR-65-121
AD-624 888 FLD. 14/2

AFFDL-TR-65-197
AD-625 543 FLD. 14/2

AFML-65-420
AD-625 045 FLD. 7/2

AFML-TR-65-417
AD-625 595 FLD. 7/4

AFML-TR-65-419
AD-625 043 FLD. 20/9

AFOSR-64-1788
AD-625 455 FLD. 20/13

AFOSR-65-1520
AD-625 577 FLD. 5/2

AFOSR-65-1557
AD-625 387 FLD. 9/10

AFOSR-65-1558
AD-625 487 FLD. 9/10

AFOSR-65-1587
AD-625 276 FLD. 20/11

AFOSR-65-1588
AD-625 279 FLD. 20/11

AFOSR-65-1671

AD-625 602 FLD. 7/4

AFOSR-69-1689
AD-625 500 FLD. 20/8

AFOSR-69-1687
AD-625 497 FLD. 7/4

AFOSR-69-1713
AD-624 864 FLD. 6/4

AFOSR-69-1729
AD-625 514 FLD. 7/3

AFOSR-69-1730
AD-625 036 FLD. 9/1

AFOSR-69-1731
AD-625 077 FLD. 7/2

AFOSR-69-1733
AD-624 944 FLD. 21/9

AFOSR-69-1736
AD-625 046 FLD. 9/2

AFOSR-69-1754
AD-625 557 FLD. 12/1

AFOSR-69-1756
AD-625 355 FLD. 12/1

AFOSR-69-1761
AD-625 548 FLD. 20/8

AFOSR-69-1762
AD-625 550 FLD. 20/12

AFOSR-69-1776
AD-625 571 FLD. 20/10

AFOSR-69-1782
AD-625 357 FLD. 20/10

AFOSR-69-1786
AD-625 096 FLD. 20/13

AFOSR-69-1787
AD-625 563 FLD. 20/8

AFOSR-69-1791
AD-625 015 FLD. 21/2

AFOSR-69-1793
AD-625 080 FLD. 7/3

AFOSR-69-1802
AD-625 591 FLD. 20/9

AFOSR-69-1809
AD-625 599 FLD. 21/8

AFOSR-69-1811
AD-625 569 FLD. 20/8

AFOSR-69-1813
AD-625 559 FLD. 20/8

AFOSR-69-1814
AD-625 561 FLD. 20/8

AFOSR-69-1815
AD-625 573 FLD. 20/8

AFOSR-69-1817
AD-625 569 FLD. 20/8

AFOSR-69-1818
AD-625 572 FLD. 20/10

AFOSR-69-1820
AD-625 600 FLD. 9/1

AFOSR-69-1823
AD-625 562 FLD. 20/10

AFOSR-69-1843
AD-625 371 FLD. 11/6

AFOSR-69-1883
AD-625 488 FLD. 12/1

AFOSR-69-1891
AD-625 498 FLD. 5/2

AFOSR-69-1903
AD-625 554 FLD. 11/6

AFOSR-69-1904
AD-625 578 FLD. 20/12

AFOSR-69-1907
AD-624 995 FLD. 20/11

AFOSR-69-2174
AD-625 588 FLD. 5/10

AFOSR-69-2183
AD-625 398 FLD. 20/8

AFOSR-69-2187
AD-625 361 FLD. 20/4

AFOSR-69-2190
AD-625 594 FLD. 20/10

AFOSR-69-2191
AD-625 597 FLD. 20/10

AFOSR-69-2192
AD-625 596 FLD. 20/8

AFOSR-69-2194
AD-625 583 FLD. 9/1

AFOSR-69-2198
AD-625 541 FLD. 11/9

AFOSR-69-2199
AD-625 535 FLD. 3/2

AFOSR-69-2200
AD-625 536 FLD. 7/4

AFOSR-69-2202
AD-625 537 FLD. 8/1

AFOSR-69-2203
AD-625 542 FLD. 9/10

AFOSR-69-2204
AD-625 546 FLD. 20/2

AFOSR-69-2205
AD-625 489 FLD. 19/4

AFOSR-69-2208
AD-625 591 FLD. 4/1

AFOSR-69-2223
AD-625 034 FLD. 6/3

AFOSR-69-2252
AD-625 342 FLD. 6/16

AFOSR-69-2259
AD-625 366 FLD. 3/2

AFOSR-69-2260
AD-625 363 FLD. 20/13

AFOSR-69-2263
AD-625 369 FLD. 9/2

AFOSR-69-2266
AD-625 367 FLD. 20/13

AFOSR-69-2391
AD-625 592 FLD. 7/3

AFOSR-69-2392
AD-625 593 FLD. 7/3

AFOSR-69-2393
AD-625 590 FLD. 7/3

AFOSR-69-2394
AD-625 589 FLD. 7/4

AFOSR-69-2444
AD-625 576 FLD. 9/5

AFOSR-69-2649
AD-625 495 FLD. 6/1

AMRA-CR69-04/3
AD-624 987 FLD. 11/6

AMRL-TR-69-37-VOL-2
AD-625 332 FLD. 1/3

AMRL-TR-69-153
AD-625 482 FLD. 6/11

AMRL-TR-69-156
AD-624 886 FLD. 6/11

AMRL-TR-69-168
AD-625 041 FLD. 9/10

APL-TR-69-113
AD-625 587 FLD. 9/3

APL-TR-69-118
AD-625 485 FLD. 11/8

ARDG(FE)-J-196
AD-624 889 FLD. 6/1

ARL-69-123
AD-625 476 FLD. 20/12

ARL-69-181
AD-625 570 FLD. 7/1

ARL-69-182
AD-625 404 FLD. 20/4

ARL-69-183
AD-625 205 FLD. 20/4

ARL-69-202
AD-625 189 FLD. 20/9

ARL-69-207
AD-625 558 FLD. 20/9

ARL-69-208
AD-625 207 FLD. 20/4

ARL-69-210
AD-625 206 FLD. 12/1

ARL-69-211
AD-625 203 FLD. 20/13

ARL-69-212
AD-625 384 FLD. 20/4

ARL-69-214
AD-625 253 FLD. 14/2

ARL-69-219
AD-625 405 FLD. 14/2

ARL-69-248
AD-625 364 FLD. 20/10

ARL-69-249
AD-625 212 FLD. 7/4

ARL-69-250
AD-625 213 FLD. 7/4

ARL-69-251
AD-625 214 FLD. 7/4

ARL-69-252
AD-625 377 FLD. 7/4

ARL-69-256
AD-625 411 FLD. 7/4

ARL-69-257
AD-625 398 FLD. 20/8

ARL-69-258
AD-625 412 FLD. 12/1

ARL-TR-69-11
AD-625 101 FLD. 6/3

ARL-TR-69-23
AD-625 333 FLD. 6/3

AROD-3138:18
AD-625 028 FLD. 11/6

AROD-3153:1
AD-624 875 FLD. 7/3

AROD-3298:22
AD-625 652 FLD. 14/4

AROD-3342:4
AD-625 650 FLD. 7/3

AROD-3342:6
AD-625 649 FLD. 7/3

AROD-3342:8
AD-625 648 FLD. 7/3

AROD-3892:1
AD-625 903 FLD. 12/2

AROD-3892:3
AD-625 904 FLD. 12/2

AROD-3892:5
AD-625 905 FLD. 12/2

AROD-3892:6
AD-625 906 FLD. 12/2

AROD-3892:9
AD-625 907 FLD. 12/2

AROD-3981:9
AD-625 635 FLD. 7/3

AROD-3981:10
AD-625 634 FLD. 7/3

AROD-3616:7
AD-625 646 FLD. 7/4

AROD-3616:8
AD-625 643 FLD. 7/4

AROD-3616:9
AD-625 639 FLD. 7/4

AROD-3631:1
AD-625 218 FLD. 7/3

AROD-3631:2
AD-625 638 FLD. 7/3

AROD-3631:3
AD-625 637 FLD. 7/3

AROD-3631:4
AD-625 636 FLD. 7/3

AROD-3772:9
AD-625 654 FLD. 12/1

AROD-4016:5
AD-625 656 FLD. 20/4

AROD-4047:1
AD-625 175 FLD. 7/4

AROD-4222:5
AD-625 176 FLD. 7/3

AROD-4222:6
AD-625 177 FLD. 7/3

AROD-4625 1
AD-625 174 FLD. 11/9

AS-65-16
AD-625 622 FLD. 20/4

ASRL-TR-134-1
AD-624 999 FLD. 20/11

ATD-65-77
AD-625 079 FLD. 20/2

ATD-65-86
AD-624 996 FLD. 7/4

ATD-65-91 2
AD-625 312 FLD. 20/3

ATD-65-107
AD-625 263 FLD. 6/11

ATD-65-109
AD-624 997 FLD. 11/6

ATD-65-110
AD-624 934 FLD. 6/18

ATD-65-111
AD-625 326 FLD. 19/4

ATD-65-112
AD-625 198 FLD. 10/1

B/L-8526-IR-1
AD-625 319 FLD. 19/7

BN-411
AD-625 033 FLD. 20/9

BR/D-3
AD-625 386 FLD. 17/4

BULL-33
AD-625 006 FLD. 8/11

BULL-34
AD-625 221 FLD. 8/11

BUSHIPS TRANS. NO. 943
AD-625 076 FLD. 20/11

CAL-88-1840-S-1
AD-624 860 FLD. 1/1

CERN-65-61
AD-625 014 FLD. 18/8

CNIE-PE-2
AD-625 036 FLD. 9/1

CONESCO-9891-1
AD-625 385 FLD. 13/10

CR-65-919-17
AD-625 310 FLD. 9/5

CRPL-900-11-1000422
AD-625 139 FLD. 20/14

DASA-1708
AD-625 980 FLD. 9/1

DRL-A-250
AD-624 926 FLD. 14/2

DRML-RP-553
AD-625 104 FLD. 17/2

DRML-RP-565
AD-625 434 FLD. 6/19

DRMLRP-541
AD-625 103 FLD. 5/10

DSR-5393-1
AD-624 885 FLD. 13/7

DSR-8891
AD-625 179 FLD. 7/4

DTMB-2017
AD-625 339 FLD. 13/10

DTMB-2076
AD-625 327 FLD. 13/10

E-79.9
AD-625 918 FLD. 10/1

E-1866
AD-625 042 FLD. 17/7

ECOM-00240-F-VOL-1
AD-625 115 FLD. 20/6

ECOM-00240-F-VOL-2
AD-625 116 FLD. 20/6

ECOM-00384-1
AD-625 335 FLD. 9/2

ECOM-00418(E)-3
AD-625 533 FLD. 9/1

ECOM-00423-2
AD-625 341 FLD. 18/8

ECOM-01232-1
AD-625 585 FLD. 17/2.1

ECOM-01420-1
AD-624 868 FLD. 9/1

ECOM-2537
AD-625 388 FLD. 9/2

ECOM-2635
AD-625 531 FLD. 9/1

ECOM-2638
AD-625 120 FLD. 13/11

ECOM-2639
AD-625 389 FLD. 9/1

EERL-96
AD-624 983 FLD. 9/3

EM-719
AD-625 443 FLD. 8/13

EMEC-11-65
AD-625 114 FLD. 17/7

ER-13950
AD-625 453 FLD. 22/3

ERP-126
AD-625 123 FLD. 9/2

ERP-142
AD-625 134 FLD. 3/2

ERP-148
AD-625 165 FLD. 8/7

ERP-146
AD-625 131 FLD. 3/2

ERP-147
AD-625 124 FLD. 20/6

ESD-TDR-65-239
AD-624 936 FLD. 9/6

ESD-TDR-65-457
AD-625 375 FLD. 9/5

ESD-TDR-65-488
AD-625 016 FLD. 9/5

ESD-TDR-65-502
AD-625 020 FLD. 14/2

ESD-TDR-65-546
AD-625 021 FLD. 9/2

ESD-TDR-65-550
AD-625 017 FLD. 20/12

ESD-TDR-65-552
AD-625 018 FLD. 9/1

ESD-TDR-65-561
AD-625 567 FLD. 5/8

ESD-TR-65-79
AD-624 899 FLD. 9/3

ESD-TR-65-405
AD-624 893 FLD. 5/3

ESD-TR-65-477
AD-625 099 FLD. 9/2

F-82232
AD-625 376 FLD. 13/9

FA-R-1778

AD-629 879 FLD. 11/2

FTD-MT-69-273
AD-629 284 FLD. 1/2

FTD-MT-69-982
AD-629 236 FLD. 20/9

FTD-MT-69-09
AD-629 919 FLD. 3/2

FTD-MT-69-69
AD-629 300 FLD. 22/2

FTD-MT-69-99
AD-629 239 FLD. 20/9

FTD-TT-69-708
AD-629 038 FLD. 20/6

FTD-TT-69-718
AD-629 039 FLD. 18/8

FTD-TT-69-1092
AD-629 304 FLD. 11/9

FTD-TT-69-1099
AD-629 296 FLD. 11/2

FTD-TT-69-359
AD-629 261 FLD. 9/5

FTD-TT-69-996
AD-629 057 FLD. 7/3

FTD-TT-69-634
AD-629 240 FLD. 9/2

FTD-TT-69-669
AD-629 194 FLD. 21/5

FTD-TT-69-671
AD-629 182 FLD. 21/5

FTD-TT-69-672
AD-629 241 FLD. 6/5

FTD-TT-69-680
AD-629 242 FLD. 21/5

FTD-TT-69-688
AD-629 192 FLD. 5/9

FTD-TT-69-722
AD-629 059 FLD. 11/10

FTD-TT-69-740
AD-629 229 FLD. 13/8

FTD-TT-69-791
AD-629 090 FLD. 14/2

FTD-TT-69-793
AD-629 197 FLD. 20/1

FTD-TT-69-794
AD-629 000 FLD. 11/8

FTD-TT-69-795
AD-629 053 FLD. 11/8

FTD-TT-69-796
AD-629 228 FLD. 13/8

FTD-TT-69-803
AD-629 196 FLD. 20/5

FTD-TT-69-839
AD-629 093 FLD. 16/2

FTD-TT-69-857
AD-629 092 FLD. 11/9

FTD-TT-69-869
AD-629 052 FLD. 20/11

FTD-TT-69-925
AD-629 302 FLD. 7/4

FTD-TT-69-937
AD-629 289 FLD. 20/4

FTD-TT-69-976
AD-629 909 FLD. 11/6

FTD-TT-69-986
AD-629 286 FLD. 11/9

FTD-TT-69-990
AD-629 906 FLD. 13/7

FTD-TT-69-991
AD-629 285 FLD. 13/9

FTD-TT-69-994
AD-629 929 FLD. 20/11

FTD-TT-69-995
AD-629 288 FLD. 9/2

FTD-TT-69-996
AD-629 287 FLD. 9/1

FTD-TT-69-1004
AD-629 150 FLD. 19/1

FTD-TT-69-1009
AD-629 908 FLD. 11/6

FTD-TT-69-1010
AD-629 909 FLD. 13/8

FTD-TT-69-1013
AD-629 141 FLD. 13/11

FTD-TT-69-1014
AD-629 144 FLD. 21/5

FTD-TT-69-1018
AD-629 151 FLD. 21/2

FTD-TT-69-1020
AD-629 149 FLD. 21/5

FTD-TT-69-1024
AD-629 145 FLD. 13/8

FTD-TT-69-1025
AD-629 290 FLD. 21/5

FTD-TT-69-1027
AD-629 291 FLD. 13/11

FTD-TT-69-1030
AD-629 056 FLD. 20/4

FTD-TT-69-1034
AD-629 919 FLD. 21/2

FTD-TT-69-1039
AD-629 910 FLD. 21/7

FTD-TT-69-1048
AD-629 142 FLD. 21/3

FTD-TT-69-1050
AD-629 148 FLD. 11/6

FTD-TT-69-1054
AD-629 301 FLD. 14/4

FTD-TT-69-1058
AD-629 292 FLD. 13/1

FTD-TT-69-1056
AD-629 146 FLD. 7/2

FTD-TT-69-1063
AD-629 155 FLD. 11/8

FTD-TT-69-1064
AD-629 143 FLD. 21/4

FTD-TT-69-1071
AD-629 147 FLD. 20/11

FTD-TT-69-1072
AD-629 293 FLD. 11/6

FTD-TT-69-1073
AD-629 911 FLD. 11/6

FTD-TT-69-1074
AD-629 294 FLD. 20/2

FTD-TT-69-1076
AD-629 152 FLD. 20/11

FTD-TT-69-1078
AD-629 311 FLD. 20/6

FTD-TT-69-1079
AD-629 303 FLD. 17/2

FTD-TT-69-1081
AD-629 295 FLD. 9/2

FTD-TT-69-1090
AD-629 154 FLD. 11/6

FTD-TT-69-1104
AD-629 912 FLD. 11/4

FTD-TT-69-1106
AD-629 158 FLD. 19/4

FTD-TT-69-1107
AD-629 058 FLD. 20/4

FTD-TT-69-1108
AD-629 156 FLD. 9/2

FTD-TT-69-1109
AD-629 153 FLD. 20/12

FTD-TT-69-1114
AD-629 059 FLD. 21/2

FTD-TT-69-1119
AD-629 060 FLD. 20/4

FTD-TT-69-1121
AD-629 245 FLD. 20/11

FTD-TT-69-1122
AD-629 061 FLD. 21/2

FTD-TT-69-1125
AD-629 246 FLD. 21/4

FTD-TT-69-1126
AD-629 248 FLD. 21/4

FTD-TT-69-1127
AD-629 247 FLD. 21/4

FTD-TT-69-1128
AD-629 063 FLD. 9/5

FTD-TT-69-1129
AD-629 184 FLD. 13/7

FTD-TT-69-1130
AD-629 064 FLD. 14/2

FTD-TT-69-1134
AD-629 065 FLD. 20/4

FTD-TT-69-1135
AD-629 265 FLD. 10/1

FTD-TT-69-1136
AD-629 187 FLD. 20/4

FTD-TT-69-1137
AD-629 066 FLD. 4/1

FTD-TT-69-1139
AD-629 157 FLD. 9/1

FTD-TT-69-1141
AD-629 001 FLD. 21/5

FTD-TT-69-1142
AD-629 186 FLD. 10/2

FTD-TT-69-1143
AD-629 159 FLD. 20/11

FTD-TT-69-1153
AD-629 183 FLD. 10/2

FTD-TT-69-1157
AD-629 185 FLD. 21/4

FTD-TT-69-1158
AD-625 068 FLD. 13/8

FTD-TT-69-1159
AD-625 069 FLD. 13/8

FTD-TT-69-1160
AD-625 195 FLD. 19/7

FTD-TT-69-1165
AD-625 277 FLD. 9/1

FTD-TT-69-1168
AD-625 070 FLD. 20/9

FTD-TT-69-1170
AD-625 071 FLD. 9/5

FTD-TT-69-1171
AD-625 009 FLD. 20/6

FTD-TT-69-1174
AD-625 072 FLD. 9/5

FTD-TT-69-1183
AD-625 161 FLD. 13/8

FTD-TT-69-1193
AD-625 160 FLD. 11/8

FTD-TT-69-1230
AD-625 162 FLD. 20/11

FTD-TT-69-1237
AD-625 305 FLD. 12/1

FTD-TT-69-1242
AD-625 167 FLD. 13/9

FTD-TT-69-1247
AD-625 168 FLD. 11/9

FTD-TT-69-1252
AD-625 297 FLD. 20/11

FTD-TT-69-1289
AD-625 249 FLD. 20/2

FTD-TT-69-1295
AD-625 250 FLD. 9/1

FTD-TT-69-1331
AD-625 059 FLD. 11/10

FTD-TT-69-1619
AD-625 243 FLD. 20/9

FTD-TT-69-1656
AD-625 244 FLD. 21/8

FTD-TT-69-1659
AD-624 913 FLD. 10/2

FTD-TT-69-1772
AD-625 298 FLD. 21/8.1

G-6918
AD-625 125 FLD. 7/3

GA-6699
AD-625 480 FLD. 9/1

GA/MECH/69-38
AD-625 395 FLD. 22/2

GA/MECH/69-40
AD-625 373 FLD. 3/3

GA/MECH/69-41
AD-625 394 FLD. 22/3

GAM/MECH/68-24
AD-625 372 FLD. 12/1

GAM/MECH/69-27
AD-625 991 FLD. 20/11

GD/C-DBE-69-028
AD-625 582 FLD. 21/2

GIMRADA-RN-13
AD-625 258 FLD. 8/9

GIMRADA-RN-14
AD-625 356 FLD. 8/9

GLR-40
AD-624 897 FLD. 6/3

GSF/MECH/69-32
AD-625 442 FLD. 22/2

GSF/MECH-69-43
AD-625 393 FLD. 8/7

HIC-84
AD-625 499 FLD. 21/8

IDA/HQ-69-9191
AD-625 199 FLD. 17/10

IITRI-C206-13
AD-625 077 FLD. 7/2

IITRI-L6022-2
AD-625 916 FLD. 6/12

INSTRUMENTATION PAPERS-84
AD-625 132 FLD. 14/2

IP-79
AD-625 188 FLD. 9/2

ISL-69-2
AD-625 096 FLD. 9/2

JA-2325A
AD-625 018 FLD. 9/1

JA-2911
AD-625 021 FLD. 9/2

JA-2993
AD-625 016 FLD. 9/5

JA-2990
AD-625 017 FLD. 20/12

JA-2990
AD-625 020 FLD. 14/2

JG-8
AD-624 899 FLD. 12/1

JG-9
AD-624 898 FLD. 8/8

M65-269
AD-624 928 FLD. 7/2

MAB-206-M(3)
AD-625 049 FLD. 13/8

MAB-216-M SUPERSEDED
AD-625 606 FLD. 14/2

MAC-TR-21
AD-624 943 FLD. 9/2

ME-4
AD-625 259 FLD. 11/5

MECH/GSF-69-38
AD-625 391 FLD. 19/4

MISCELLANEOUS PAPER-4-280
AD-625 601 FLD. 14/2

MISCELLANEOUS PUBLICATION-12
AD-625 256 FLD. 6/13

ML-1343
AD-625 315 FLD. 20/1

ML-TDR-64-139
AD-624 988 FLD. 7/2

ML-TR-65-289
AD-625 125 FLD. 7/3

MPL-U-22/69
AD-624 984 FLD. 20/4

MPL-U-62/69
AD-624 985 FLD. 7/4

MPL-U-76/69
AD-624 986 FLD. 20/1

MSU-RM-147
AD-624 898 FLD. 8/8

MTI-69TR37
AD-625 423 FLD. 13/9

NADC-AE-6917
AD-625 530 FLD. 13/10

NADC-MR-6901
AD-625 254 FLD. 6/19

NAVMED-MR009.08-1200-2
AD-624 917 FLD. 6/18

NAVMED-MR009.09-1601.7.8
AD-625 459 FLD. 6/5

NAVMED-MR009-13-6001-119
AD-625 323 FLD. 6/19

NAVTRADEVCEN-1490-1
AD-625 129 FLD. 5/9

NAVTRADEVCEN-1579-1
AD-625 378 FLD. 9/9

NAVTRADEVCEN-IH-11
AD-625 525 FLD. 6/19

NAVTRADEVCEN-IH-34
AD-625 130 FLD. 5/10

NAVWEPS-8824
AD-625 519 FLD. 20/8

NAVWEPS-8990
AD-625 513 FLD. 19/8

NAVWEPS-9003
AD-624 998 FLD. 20/9

NAVWEPS-9010
AD-624 999 FLD. 20/6

NBS-8962
AD-625 336 FLD. 7/4

NEL-1314
AD-625 262 FLD. 9/5

NOLTR-69-55
AD-625 225 FLD. 6/4

NOTS-TP-3685
AD-624 935 FLD. 20/9

NOTS-TP-3959
AD-625 513 FLD. 19/8

NOTS-TP-3978
AD-624 998 FLD. 20/9

NOTS-TP-3989
AD-624 999 FLD. 20/6

NRC-7880
AD-624 954 FLD. 14/2

NRC-8374
AD-624 955 FLD. 9/5

NRC-8498
AD-624 956 FLD. 6/3

NRC-8509
AD-624 957 FLD. 9/3

NRC-8518
AD-624 958 FLD. 3/2

NRC-8530
AD-624 959 FLD. 20/13

NRC-8541

AD-629 960 FLD. 6/1

NRC-8951
AD-629 961 FLD. 20/2

NRC-8961
AD-629 962 FLD. 7/4

NRC-8971
AD-629 963 FLD. 7/4

NRC-8991
AD-629 964 FLD. 7/4

NRC-8998
AD-629 965 FLD. 7/4

NRC-8609
AD-629 966 FLD. 7/4

NRC-8611
AD-629 967 FLD. 11/6

NRC-8619
AD-629 968 FLD. 7/4

NRC-8621
AD-629 969 FLD. 7/4

NRC-8629
AD-629 970 FLD. 11/6

NRC-8633
AD-629 971 FLD. 8/1

NRC-8638
AD-629 972 FLD. 7/4

NRC-8639
AD-629 973 FLD. 7/4

NRC-8641
AD-629 974 FLD. 7/4

NRC-8649
AD-629 975 FLD. 7/2

NRC-8696
AD-629 976 FLD. 14/2

NRC-8718
AD-629 977 FLD. 11/4

NRL-6333
AD-629 940 FLD. 10/2

NRL-6337
AD-629 933 FLD. 20/4

NRL-6341
AD-629 939 FLD. 4/1

NRL-6369
AD-629 374 FLD. 11/6

NVR-3920
AD-629 341 FLD. 18/8

OAR69-10
AD-629 509 FLD. 5/2

OAR-69-13
AD-629 996 FLD. 5/2

OCNE-MN-65-1
AD-629 322 FLD. 12/1

ONR-22-VOL-1
AD-629 007 FLD. 4/1

ORC-69-23
AD-629 369 FLD. 12/2

P-1690
AD-629 353 FLD. 19/5

P-2580
AD-629 384 FLD. 14/2

P-2890
AD-629 352 FLD. 14/1

P-2897
AD-629 351 FLD. 5/3

P-2701-1
AD-629 234 FLD. 5/11

P-2728
AD-629 390 FLD. 13/6

P-3170
AD-629 291 FLD. 19/3

P-3243
AD-624 890 FLD. 5/2

P-3277
AD-624 902 FLD. 5/3

P-3282
AD-629 260 FLD. 4/1

P-3286
AD-629 472 FLD. 5/1

PIBMRI-1297-68
AD-629 362 FLD. 20/3

PIBMRI-1299-68
AD-629 492 FLD. 4/1

PLASTEC-23
AD-624 922 FLD. 11/9

PMR-TM-68-2
AD-629 118 FLD. 14/2

PR-1
AD-629 932 FLD. 11/6

PRC-D-796
AD-629 172 FLD. 19/3

PSRP-138
AD-629 166 FLD. 20/12

PSRP-141
AD-629 139 FLD. 20/14

PSRP-144
AD-629 138 FLD. 20/8

PSRP-146
AD-629 171 FLD. 20/9

PSRP-149
AD-629 138 FLD. 19/7

PSRP-153
AD-629 169 FLD. 20/12

PSRP-157
AD-629 163 FLD. 17/9

PSRP-158
AD-629 128 FLD. 20/14

PSRP-159
AD-629 122 FLD. 20/14

PSRP-160
AD-629 121 FLD. 7/3

QLR-69-14
AD-629 044 FLD. 21/2

R-270
AD-629 200 FLD. 9/1

R-272
AD-629 201 FLD. 9/1

R-1779
AD-629 091 FLD. 9/1

R-1780
AD-629 912 FLD. 19/1

R-6213
AD-624 944 FLD. 21/9

RAC-P-12
AD-629 050 FLD. 12/2

RAC-TP-143
AD-629 048 FLD. 12/1

RAC-TP-160
AD-629 047 FLD. 12/2

RADC-TDR-63-440-V2
AD-629 549 FLD. 9/8

RB-69-28
AD-629 403 FLD. 5/10

RDTR-66
AD-629 008 FLD. 7/4

REF-69-36
AD-629 180 FLD. 4/2

REPRINT-R-31
AD-629 366 FLD. 3/2

RM-69-17
AD-629 474 FLD. 5/10

RM-144
AD-624 899 FLD. 12/1

RM-244J
AD-629 565 FLD. 14/2

RM-4286-PR
AD-629 407 FLD. 21/4

RM-4579-NIH
AD-629 410 FLD. 6/5

RM-4732-ARPA
AD-629 232 FLD. 17/1

RM-4741-ARPA
AD-629 074 FLD. 18/3

RM-4747-PR
AD-629 233 FLD. 4/1

RM-4763-PR
AD-629 268 FLD. 20/9

RM-4793-PR
AD-629 409 FLD. 5/2

RM-4818-PR
AD-629 011 FLD. 4/1

RP-383
AD-629 102 FLD. 5/10

RP-P-210
AD-629 199 FLD. 17/10

RR-69-9E2-511-R1
AD-624 927 FLD. 20/9

RRA-T54-1
AD-629 115 FLD. 20/6

RRA-T54-2
AD-629 116 FLD. 20/6

RRL-254
AD-629 413 FLD. 17/3

RSIC-476
AD-629 517 FLD. 20/11

SA-TR18-1095
AD-624 993 FLD. 11/3

SCIENTIFIC-1
AD-629 451 FLD. 7/4
AD-629 453 FLD. 22/3

SCIENTIFIC-2
AD-629 081 FLD. 12/1

SCIENTIFIC-3
AD-629 082 FLD. 20/9
AD-629 497 FLD. 7/4

SCIENTIFIC-4
AD-629 939 FLD. 9/2

SCIENTIFIC-5
AD-629 381 FLD. 3/2

SCIENTIFIC-6
AD-629 361 FLD. 20/9

SCIENTIFIC-16
AD-629 369 FLD. 20/10

SCIENTIFIC-21
AD-629 379 FLD. 9/1

SCIENTIFIC-22
AD-629 392 FLD. 9/5

SCIENTIFIC-27
AD-629 212 FLD. 7/9

SCIENTIFIC-28 SCIENTIFIC-29
AD-629 911 FLD. 7/9

SCIENTIFIC-33
AD-629 213 FLD. 7/9

SCIENTIFIC-36
AD-629 214 FLD. 7/9

SCIENTIFIC-37
AD-629 377 FLD. 7/9

SCIENTIFIC-38
AD-629 398 FLD. 20/8

SCIENTIFIC-42
AD-629 412 FLD. 12/1

SCIENTIFIC-299
AD-629 609 FLD. 20/14

SDC-TM-92
AD-629 981 FLD. 9/2

SDC-TM-2629/100/00
AD-629 917 FLD. 9/2

SEL-69-083
AD-629 991 FLD. 20/14

SIT(DL)1031
AD-629 368 FLD. 1/2

SP-1923/000/00
AD-629 002 FLD. 5/1

SP-1896/000/01
AD-629 992 FLD. 5/9

SP-2030/001/02
AD-629 003 FLD. 9/2

SP-2213
AD-629 937 FLD. 5/9

SP-2239
AD-629 004 FLD. 5/9

SP-2261/000/00
AD-629 941 FLD. 5/9

SP-2279/000/00
AD-629 005 FLD. 5/7

SR-30
AD-629 139 FLD. 20/14

SR-34
AD-629 170 FLD. 9/5

SR-36
AD-629 169 FLD. 17/9

SRI-TR-9
AD-629 346 FLD. 11/11

SRL-69-0009
AD-629 010 FLD. 12/1

SRRC-RR-69-96
AD-629 082 FLD. 20/9

SSD-69-172(9141)R
AD-629 041 FLD. 5/10

SSD-69-249 (9961
AD-629 870 FLD. 15/3

SSL(UC)-6-50
AD-629 178 FLD. 3/2

STB-66-15
AD-629 119 FLD. 5/9

SU-DMS-69-33
AD-629 023 FLD. 20/2

SUDAER-227
AD-629 275 FLD. 20/11

SUDAER-231
AD-629 276 FLD. 20/11

T66-1-1
AD-629 529 FLD. 19/1

T-922-R
AD-629 931 FLD. 7/9

T-923-R
AD-629 930 FLD. 7/9

T/AM-279
AD-629 037 FLD. 20/9

TG-230-T983
AD-629 579 FLD. 19/9

TG-230-T961
AD-629 609 FLD. 19/2

TM-1-69
AD-629 999 FLD. 8/10

TM-7-65
AD-629 117 FLD. 5/3

TM-9-65
AD-629 231 FLD. 17/8

TM-10-65
AD-629 230 FLD. 17/8

TM-738/019/00
AD-629 938 FLD. 9/2

TM-738/017/00
AD-629 940 FLD. 9/2

TM-738/019/00
AD-629 939 FLD. 9/2

TM-1797
AD-629 658 FLD. 19/1

TM-1767
AD-629 659 FLD. 19/1

TM-2543
AD-629 992 FLD. 5/10

TM-03728
AD-629 899 FLD. 5/3

TM-04063
AD-629 893 FLD. 5/3

TN-30
AD-629 961 FLD. 20/9

TN-349
AD-629 079 FLD. 13/7

TN-1968-18
AD-629 379 FLD. 9/5

TN-N-727
AD-629 920 FLD. 13/11

TN-N-752
AD-629 921 FLD. 13/10

TN-N-779
AD-629 928 FLD. 12/1

TN-N-783
AD-629 902 FLD. 13/13

TR-1
AD-629 918 FLD. 5/10

TR-2
AD-629 908 FLD. 20/11

TR-3
AD-629 920 FLD. 5/10
AD-629 929 FLD. 20/8
AD-629 387 FLD. 5/10
AD-629 939 FLD. 20/3

TR-3-703
AD-629 390 FLD. 13/6

TR-4
AD-629 273 FLD. 20/3
AD-629 987 FLD. 5/10

TR-5
AD-629 869 FLD. 6/9
AD-629 349 FLD. 11/11

TR-6
AD-629 349 FLD. 11/11

TR-8
AD-629 329 FLD. 11/9

TR-10
AD-629 330 FLD. 11/9
AD-629 992 FLD. 5/10

TR-11
AD-629 331 FLD. 11/9

TR-19(60)
AD-629 940 FLD. 7/9

TR-17
AD-629 019 FLD. 5/10

TR-18
AD-629 211 FLD. 7/9

TR-22
AD-629 928 FLD. 20/12

TR-36
AD-629 343 FLD. 7/9

TR-39
AD-629 272 FLD. 12/1

TR-43
AD-629 956 FLD. 12/1

TR-44
AD-629 968 FLD. 20/11

TR-48
AD-629 269 FLD. 12/1

TR-49
AD-629 271 FLD. 12/1

TR-50
AD-629 270 FLD. 12/1

TR-52
AD-629 269 FLD. 12/1

TR-65-52
AD-629 962 FLD. 8/11

TR-65-58
AD-629 916 FLD. 8/11

TR-65-96
AD-629 967 FLD. 8/11

TR-65-99
AD-629 960 FLD. 8/11

TR-65-112

AD-629 914 FLD. 8/11

TR-69-119
AD-629 915 FLD. 8/11

TR-69-120
AD-629 918 FLD. 8/11

TR-69-128
AD-629 961 FLD. 8/11

TR-69-129
AD-629 969 FLD. 8/11

TR-69-1909
AD-629 891 FLD. 11/10

TR-69-2812
AD-629 136 FLD. 11/8

TR-69-2999
AD-629 287 FLD. 11/6

TR-89
AD-629 983 FLD. 9/3

TR-112
AD-629 960 FLD. 13/1

TR-190-1
AD-629 999 FLD. 1/2

TR-394
AD-629 936 FLD. 9/6

TR-400-119
AD-629 379 FLD. 9/1

TR-400-120
AD-629 392 FLD. 9/8

TR-413
AD-629 267 FLD. 20/13

TR-AE-6909
AD-629 099 FLD. 20/13

TRANS-246
AD-629 916 FLD. 17/7

TRANSLATION 1038
AD-629 632 FLD. 6/13

TRANSLATION-1099
AD-629 621 FLD. 9/2

TRANSLATION-1365
AD-629 697 FLD. 6/13

TRANSLATION-1366
AD-629 691 FLD. 6/13

TRANSLATION-1367
AD-629 629 FLD. 6/13

TRANSLATION-1368
AD-629 623 FLD. 6/13

TRANSLATION-1370
AD-629 624 FLD. 6/3

TRANSLATION-1371
AD-629 697 FLD. 6/13

TRANSLATION-1372
AD-629 614 FLD. 6/13

TRANSLATION-1373
AD-629 631 FLD. 6/13

TRANSLATION-1374
AD-629 626 FLD. 6/1

TRANSLATION-1376
AD-629 629 FLD. 6/3

TRANSLATION-1377
AD-629 653 FLD. 6/3

TRANSLATION-1379
AD-629 627 FLD. 6/3

TRANSLATION-1380
AD-629 620 FLD. 6/13

TRANSLATION-1381
AD-629 608 FLD. 6/13

TRANSLATION-1382
AD-629 628 FLD. 6/13

TRANSLATION-1387
AD-629 610 FLD. 6/3

TRANSLATION-1389
AD-629 618 FLD. 19/2

TRANSLATION-1390
AD-629 617 FLD. 6/13

TRANSLATION-1402
AD-629 611 FLD. 6/13

TRANSLATION-2037
AD-629 619 FLD. 13/10

TRANSLATION-2039
AD-629 612 FLD. 7/3

TRANSLATION-2042
AD-629 603 FLD. 7/4

TRANSLATION-2043
AD-629 613 FLD. 11/9

TRANSLATION NO. 1026
AD-629 630 FLD. 6/13

TRN-161
AD-629 222 FLD. 5/9

TRN-162
AD-629 223 FLD. 5/9

TRN-163
AD-629 224 FLD. 5/9

TT-69-64812
AD-629 905 FLD. 11/6

TT-69-64813
AD-629 906 FLD. 13/7

TT-69-64815
AD-629 908 FLD. 11/6

TT-69-64816
AD-629 909 FLD. 13/8

TT-69-64817
AD-629 910 FLD. 21/7

TT-69-64818
AD-629 911 FLD. 11/6

TT-69-64819
AD-629 912 FLD. 11/9

TT-69-64820
AD-629 913 FLD. 10/2

TT-69-64821
AD-629 914 FLD. 3/2

TT-69-64822
AD-629 915 FLD. 21/2

TT-69-64823
AD-629 916 FLD. 17/7

TT-69-64827
AD-629 924 FLD. 20/11

TT-69-64828
AD-629 934 FLD. 6/18

TT-69-64829
AD-629 996 FLD. 7/4

TT-69-64830
AD-629 997 FLD. 11/6

TT-69-64831
AD-629 000 FLD. 11/8

TT-69-64832
AD-629 001 FLD. 21/5

TT-69-64833
AD-629 009 FLD. 20/6

TT-69-64834
AD-629 038 FLD. 20/6

TT-69-64835
AD-629 039 FLD. 18/8

TT-69-64836
AD-629 092 FLD. 20/11

TT-69-64837
AD-629 093 FLD. 11/8

TT-69-64838
AD-629 094 FLD. 11/10

TT-69-64839
AD-629 095 FLD. 11/10

TT-69-64840
AD-629 096 FLD. 20/9

TT-69-64841
AD-629 097 FLD. 7/3

TT-69-64842
AD-629 098 FLD. 20/9

TT-69-64844
AD-629 060 FLD. 20/9

TT-69-64845
AD-629 061 FLD. 21/2

TT-69-64847
AD-629 063 FLD. 9/5

TT-69-64848
AD-629 064 FLD. 14/2

TT-69-64849
AD-629 065 FLD. 20/9

TT-69-64850
AD-629 066 FLD. 9/1

TT-69-64852
AD-629 068 FLD. 13/8

TT-69-64853
AD-629 069 FLD. 13/8

TT-69-64854
AD-629 070 FLD. 20/9

TT-69-64855
AD-629 071 FLD. 9/5

TT-69-64856
AD-629 072 FLD. 9/5

TT-69-64858
AD-629 075 FLD. 20/2

TT-69-64859
AD-629 076 FLD. 20/11

TT-69-64861
AD-629 090 FLD. 14/2

TT-69-64863
AD-629 092 FLD. 11/9

TT-66-60000
AD-629 093 FLD. 16/2

TT-66-60002
AD-629 141 FLD. 13/11

TT-66-60003
AD-629 142 FLD. 21/3

TT-66-60004
AD-629 143 FLD. 21/9

TT-66-60005
AD-625 144 FLD. 21/5

TT-66-60006
AD-625 145 FLD. 13/8

TT-66-60007
AD-625 146 FLD. 7/2

TT-66-60008
AD-625 147 FLD. 20/11

TT-66-60009
AD-625 148 FLD. 11/6

TT-66-60010
AD-625 149 FLD. 21/5

TT-66-60011
AD-625 150 FLD. 19/1

TT-66-60012
AD-625 151 FLD. 21/2

TT-66-60013
AD-625 152 FLD. 20/11

TT-66-60014
AD-625 153 FLD. 20/12

TT-66-60015
AD-625 154 FLD. 11/6

TT-66-60016
AD-625 155 FLD. 11/8

TT-66-60017
AD-625 156 FLD. 9/2

TT-66-60018
AD-625 157 FLD. 9/1

TT-66-60019
AD-625 158 FLD. 19/4

TT-66-60020
AD-625 159 FLD. 20/11

TT-66-60021
AD-625 160 FLD. 11/8

TT-66-60022
AD-625 161 FLD. 13/8

TT-66-60023
AD-625 162 FLD. 20/11

TT-66-60024
AD-625 167 FLD. 13/9

TT-66-60025
AD-625 168 FLD. 11/9

TT-66-60026
AD-625 182 FLD. 21/5

TT-66-60027
AD-625 183 FLD. 10/2

TT-66-60028
AD-625 184 FLD. 13/7

TT-66-60029
AD-625 185 FLD. 21/4

TT-66-60030
AD-625 186 FLD. 10/2

TT-66-60031
AD-625 187 FLD. 20/4

TT-66-60032
AD-625 192 FLD. 5/9

TT-66-60033
AD-625 194 FLD. 21/5

TT-66-60034
AD-625 195 FLD. 13/7

TT-66-60035
AD-625 196 FLD. 20/5

TT-66-60036
AD-625 197 FLD. 20/1

TT-66-60037
AD-625 198 FLD. 10/1

TT-66-60038
AD-625 100 FLD. 6/3

TT-66-60042
AD-625 228 FLD. 13/8

TT-66-60043
AD-625 229 FLD. 13/8

TT-66-60044
AD-625 236 FLD. 20/4

TT-66-60045
AD-625 239 FLD. 20/9

TT-66-60046
AD-625 240 FLD. 9/2

TT-66-60047
AD-625 241 FLD. 6/5

TT-66-60048
AD-625 242 FLD. 21/5

TT-66-60049
AD-625 243 FLD. 20/4

TT-66-60050
AD-625 244 FLD. 21/5

TT-66-60051
AD-625 245 FLD. 20/11

TT-66-60052
AD-625 246 FLD. 21/4

TT-66-60053
AD-625 247 FLD. 21/4

TT-66-60054
AD-625 248 FLD. 21/4

TT-66-60055
AD-625 249 FLD. 20/2

TT-66-60056
AD-625 250 FLD. 9/1

TT-66-60057
AD-625 261 FLD. 9/5

TT-66-60058
AD-625 263 FLD. 6/11

TT-66-60059
AD-625 265 FLD. 10/1

TT-66-60060
AD-625 274 FLD. 6/3

TT-66-60061
AD-625 277 FLD. 9/1

TT-66-60062
AD-625 284 FLD. 1/2

TT-66-60063
AD-625 285 FLD. 13/9

TT-66-60064
AD-625 286 FLD. 11/9

TT-66-60065
AD-625 287 FLD. 9/1

TT-66-60066
AD-625 288 FLD. 9/2

TT-66-60067
AD-625 289 FLD. 20/4

TT-66-60068
AD-625 290 FLD. 21/5

TT-66-60069
AD-625 291 FLD. 13/11

TT-66-60070
AD-625 292 FLD. 13/1

TT-66-60071
AD-625 293 FLD. 11/6

TT-66-60072
AD-625 294 FLD. 20/2

TT-66-60073
AD-625 295 FLD. 9/2

TT-66-60074
AD-625 296 FLD. 11/2

TT-66-60075
AD-625 297 FLD. 20/11

TT-66-60076
AD-625 298 FLD. 21/8.1

TT-66-60077
AD-625 300 FLD. 22/2

TT-66-60078
AD-625 301 FLD. 14/4

TT-66-60080
AD-625 303 FLD. 17/2

TT-66-60081
AD-625 304 FLD. 11/4

TT-66-60082
AD-625 305 FLD. 12/1

TT-66-60083
AD-625 311 FLD. 20/6

TT-66-60084
AD-625 312 FLD. 20/3

TT-66-60085
AD-625 326 FLD. 19/4

TT-66-60086
AD-625 340 FLD. 9/1

TT-66-60089
AD-625 430 FLD. 7/4

TT-66-60090
AD-625 431 FLD. 7/4

TT-66-60091
AD-625 510 FLD. 13/10

TT-66-60093
AD-625 517 FLD. 20/11

TT-66-60094
AD-625 574 FLD. 19/4

TT-66-60096
AD-625 603 FLD. 7/4

TT-66-60097
AD-625 605 FLD. 14/2

TT-66-60098
AD-625 608 FLD. 6/13

TT-66-60099
AD-625 610 FLD. 6/3

TT-66-60100
AD-625 611 FLD. 6/13

TT-66-60101
AD-625 612 FLD. 7/3

TT-66-60102
AD-625 613 FLD. 11/4

TT-66-60103
AD-625 614 FLD. 13/10

TT-66-60104

AD-625 615 FLD. 19/2

TT-66-60105
AD-625 616 FLD. 6/13

TT-66-60106
AD-625 617 FLD. 6/13

TT-66-60107
AD-625 620 FLD. 6/13

TT-66-60108
AD-625 621 FLD. 9/2

TT-66-60109
AD-625 623 FLD. 6/13

TT-66-60110
AD-625 624 FLD. 6/3

TT-66-60111
AD-625 625 FLD. 6/3

TT-66-60112
AD-625 626 FLD. 6/1

TT-66-60113
AD-625 627 FLD. 6/3

TT-66-60114
AD-625 628 FLD. 6/13

TT-66-60115
AD-625 629 FLD. 6/13

TT-66-60116
AD-625 630 FLD. 6/13

TT-66-60118
AD-625 632 FLD. 6/13

TT-66-60119
AD-625 633 FLD. 6/3

TT-66-60120
AD-625 640 FLD. 6/3

TT-66-60121
AD-625 641 FLD. 6/3

TT-66-60122
AD-625 642 FLD. 6/13

TT-66-60123
AD-625 644 FLD. 6/3

TT-66-60124
AD-625 645 FLD. 6/13

TT-66-60125
AD-625 647 FLD. 6/13

TT-66-60126
AD-625 651 FLD. 6/13

TT-66-60127
AD-625 653 FLD. 6/3

TT-66-60128
AD-625 655 FLD. 6/13

TT-66-60129
AD-625 657 FLD. 6/13

TT-60117
AD-625 631 FLD. 6/13

TT-669893
AD-625 059 FLD. 21/2

TT-TT-66-60079
AD-625 302 FLD. 7/4

US-807250-5
AD-625 316 FLD. 14/2

UAPL-24
AD-625 575 FLD. 10/2

UCLA-DE-69-53
AD-624 990 FLD. 6/5

UED-371-1669-0026
AD-625 464 FLD. 8/11

USA NLABS-FD-26
AD-624 869 FLD. 6/8

USA NLABS-FD-27
AD-625 983 FLD. 6/8

USA-NLABS-FD-28
AD-625 252 FLD. 6/8

USA NLABS-FD-31
AD-625 984 FLD. 6/8

USA-NLABS-FD-32
AD-624 994 FLD. 6/8

USAAVLABS-TR-65-65
AD-624 860 FLD. 1/1

USNRDL-TR-930
AD-624 917 FLD. 6/18

VITRO-TN-01856.01-4
AD-625 193 FLD. 5/2

WHOI-CONTRIB-1669
AD-625 306 FLD. 14/2

WHOI-REF-65-58
AD-625 306 FLD. 14/2

WL-TR-65-140
AD-625 958 FLD. 11/2

WL-TR-65-147
AD-625 579 FLD. 20/13

# AD-FIELD INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper).

| | |
|---|---|
| 624 860 | 1/1 |
| 624 861 | 17/2.1 |
| 624 862 | 20/9 |
| 624 863 | 12/1 |
| 624 864 | 6/9 |
| 624 865 | 20/10 |
| 624 866 | 9/9 |
| 624 867 | 11/10 |
| 624 868 | 9/1 |
| 624 869 | 6/8 |
| 624 870 | 19/3 |
| 624 871 | 6/3 |
| 624 872 | 7/9 |
| 624 873 | 6/13 |
| 624 874 | 11/2 |
| 624 875 | 7/3 |
| 624 876 | 12/1 |
| 624 877 | 20/2 |
| 624 878 | 20/3 |
| 624 879 | 20/9 |
| 624 880 | 9/5 |
| 624 881 | 20/10 |
| 624 882 | 3/2 |
| 624 883 | 3/2 |
| 624 884 | 20/12 |
| 624 885 | 13/7 |
| 624 886 | 6/11 |
| 624 887 | 8/2 |
| 624 888 | 14/2 |
| 624 889 | 6/1 |
| 624 890 | 5/2 |
| 624 891 | 11/10 |
| 624 892 | 8/13 |
| 624 893 | 5/3 |
| 624 894 | 5/3 |
| 624 895 | 3/2 |
| 624 896 | 11/3 |
| 624 897 | 6/3 |
| 624 898 | 8/8 |
| 624 899 | 12/1 |
| 624 900 | 5/10 |
| 624 901 | 5/10 |
| 624 902 | 5/3 |
| 624 903 | 4/1 |
| 624 905 | 11/6 |
| 624 906 | 13/7 |
| 624 908 | 11/6 |
| 624 909 | 13/8 |
| 624 910 | 21/7 |
| 624 911 | 11/6 |
| 624 912 | 11/9 |
| 624 913 | 10/2 |
| 624 914 | 3/2 |
| 624 915 | 21/2 |
| 624 916 | 17/7 |
| 624 917 | 6/18 |
| 624 918 | 5/10 |
| 624 919 | 5/10 |
| 624 920 | 5/10 |
| 624 921 | 5/10 |
| 624 922 | 11/9 |
| 624 923 | 14/2 |
| 624 924 | 20/11 |
| 624 925 | 20/8 |
| 624 926 | 14/2 |
| 624 927 | 20/9 |
| 624 928 | 7/2 |
| 624 929 | 15/3 |
| 624 930 | 1/3 |
| 624 933 | 20/9 |
| 624 934 | 6/18 |
| 624 935 | 20/8 |
| 624 936 | 9/6 |
| 624 937 | 5/9 |
| 624 938 | 9/2 |
| 624 939 | 9/2 |
| 624 940 | 9/2 |
| 624 941 | 5/9 |
| 624 942 | 5/9 |
| 624 943 | 9/2 |
| 624 944 | 21/9 |
| 624 946 | 9/8 |
| 624 947 | 20/6 |
| 624 948 | 4/2 |
| 624 949 | 9/8 |
| 624 950 | 20/8 |
| 624 951 | 9/8 |
| 624 952 | 20/6 |
| 624 953 | 7/3 |
| 624 954 | 14/2 |
| 624 955 | 9/8 |
| 624 956 | 6/3 |
| 624 957 | 9/3 |
| 624 958 | 3/2 |
| 624 959 | 20/13 |
| 624 960 | 6/1 |
| 624 961 | 20/2 |
| 624 962 | 7/9 |
| 624 963 | 7/9 |
| 624 964 | 7/9 |
| 624 965 | 7/9 |
| 624 966 | 7/9 |
| 624 967 | 11/6 |
| 624 968 | 7/9 |
| 624 969 | 7/9 |
| 624 970 | 11/6 |
| 624 971 | 8/1 |
| 624 972 | 7/9 |
| 624 973 | 7/9 |
| 624 974 | 7/9 |
| 624 975 | 7/2 |
| 624 976 | 14/2 |
| 624 977 | 11/9 |
| 624 980 | 20/8 |
| 624 981 | 20/12 |
| 624 982 | 22/3 |
| 624 983 | 9/3 |
| 624 984 | 20/9 |
| 624 985 | 7/9 |
| 624 986 | 20/1 |
| 624 987 | 11/6 |
| 624 988 | 7/2 |
| 624 989 | 7/2 |
| 624 990 | 6/5 |
| 624 991 | 20/19 |
| 624 992 | 5/10 |
| 624 993 | 11/3 |
| 624 994 | 6/8 |
| 624 995 | 20/11 |
| 624 996 | 7/9 |
| 624 997 | 11/6 |
| 624 998 | 20/9 |
| 624 999 | 20/6 |
| 625 000 | 11/8 |
| 625 001 | 21/8 |
| 625 002 | 5/1 |
| 625 003 | 9/2 |
| 625 004 | 5/9 |
| 625 005 | 5/7 |
| 625 006 | 8/11 |
| 625 007 | 9/1 |
| 625 008 | 7/9 |
| 625 009 | 20/6 |
| 625 010 | 12/1 |
| 625 011 | 4/1 |
| 625 012 | 14/2 |
| 625 013 | 20/3 |
| 625 014 | 18/8 |
| 625 015 | 21/2 |
| 625 016 | 9/5 |
| 625 017 | 20/12 |
| 625 018 | 9/1 |
| 625 019 | 5/10 |
| 625 020 | 14/2 |
| 625 021 | 9/2 |
| 625 022 | 5/10 |
| 625 023 | 20/2 |
| 625 024 | 7/9 |
| 625 025 | 6/3 |
| 625 026 | 3/2 |
| 625 027 | 5/2 |
| 625 028 | 11/6 |
| 625 029 | 5/2 |
| 625 030 | 11/8 |
| 625 031 | 6/5 |
| 625 032 | 3/2 |
| 625 033 | 20/9 |
| 625 034 | 6/3 |
| 625 035 | 7/3 |
| 625 036 | 4/1 |
| 625 037 | 20/4 |
| 625 038 | 20/6 |
| 625 039 | 18/8 |
| 625 040 | 13/12 |
| 625 041 | 5/10 |
| 625 042 | 17/7 |
| 625 043 | 20/9 |
| 625 044 | 21/2 |
| 625 045 | 7/2 |
| 625 046 | 9/2 |
| 625 047 | 12/2 |
| 625 048 | 12/1 |
| 625 049 | 13/8 |
| 625 050 | 12/2 |
| 625 051 | 9/1 |
| 625 052 | 20/11 |
| 625 053 | 11/8 |
| 625 054 | 11/10 |
| 625 055 | 11/10 |
| 625 056 | 20/4 |
| 625 057 | 7/3 |
| 625 058 | 20/9 |
| 625 059 | 21/2 |
| 625 060 | 20/9 |
| 625 061 | 21/2 |
| 625 063 | 9/5 |
| 625 064 | 14/2 |
| 625 065 | 20/9 |
| 625 066 | 9/1 |
| 625 068 | 13/8 |
| 625 069 | 13/8 |
| 625 070 | 20/9 |
| 625 071 | 9/5 |
| 625 072 | 9/5 |
| 625 074 | 18/3 |
| 625 075 | 20/2 |
| 625 076 | 20/11 |
| 625 077 | 7/2 |
| 625 079 | 13/7 |
| 625 080 | 7/3 |
| 625 081 | 12/1 |
| 625 082 | 20/9 |
| 625 083 | 14/2 |
| 625 084 | 20/19 |
| 625 085 | 20/9 |
| 625 086 | 20/9 |
| 625 087 | 20/9 |
| 625 088 | 20/19 |
| 625 090 | 14/2 |
| 625 092 | 11/9 |
| 625 093 | 16/2 |
| 625 094 | 9/2 |
| 625 095 | 20/13 |
| 625 096 | 20/13 |
| 625 097 | 6/3 |
| 625 098 | 20/2 |
| 625 099 | 17/2.1 |
| 625 100 | 6/3 |
| 625 101 | 6/3 |
| 625 102 | 5/10 |
| 625 103 | 5/10 |
| 625 104 | 17/2 |
| 625 105 | 20/12 |
| 625 106 | 5/10 |
| 625 107 | 5/10 |
| 625 108 | 3/2 |
| 625 109 | 5/10 |
| 625 110 | 7/9 |
| 625 111 | 6/5 |
| 625 113 | 13/13 |
| 625 114 | 17/7 |
| 625 115 | 20/6 |
| 625 116 | 20/6 |
| 625 117 | 9/5 |
| 625 118 | 14/2 |
| 625 119 | 9/9 |
| 625 120 | 13/11 |
| 625 121 | 7/3 |
| 625 122 | 20/19 |
| 625 123 | 9/2 |
| 625 124 | 20/6 |
| 625 125 | 7/3 |
| 625 127 | 10/2 |
| 625 128 | 20/19 |
| 625 129 | 9/9 |
| 625 130 | 5/10 |
| 625 131 | 3/2 |
| 625 132 | 14/2 |
| 625 133 | 20/19 |
| 625 134 | 3/2 |
| 625 135 | 18/7 |
| 625 136 | 11/8 |
| 625 137 | 4/1 |
| 625 138 | 20/8 |
| 625 139 | 20/19 |
| 625 140 | 13/1 |
| 625 141 | 13/11 |
| 625 142 | 21/3 |
| 625 143 | 21/9 |
| 625 144 | 21/5 |
| 625 145 | 13/8 |
| 625 146 | 7/2 |
| 625 147 | 20/11 |
| 625 148 | 11/6 |
| 625 149 | 21/9 |
| 625 150 | 19/1 |
| 625 151 | 21/2 |
| 625 152 | 20/11 |
| 625 153 | 20/12 |
| 625 154 | 11/6 |
| 625 155 | 11/8 |
| 625 156 | 9/2 |
| 625 157 | 9/1 |
| 625 158 | 19/9 |
| 625 159 | 20/11 |
| 625 160 | 11/8 |
| 625 161 | 13/8 |
| 625 162 | 20/11 |
| 625 163 | 17/9 |
| 625 164 | 17/9 |
| 625 165 | 8/7 |
| 625 166 | 20/12 |
| 625 167 | 13/9 |
| 625 168 | 11/9 |
| 625 169 | 20/12 |
| 625 170 | 9/9 |
| 625 171 | 20/9 |
| 625 172 | 19/3 |
| 625 173 | 13/12 |
| 625 174 | 11/9 |
| 625 175 | 7/9 |
| 625 176 | 7/3 |
| 625 177 | 7/3 |
| 625 178 | 3/2 |
| 625 179 | 7/9 |
| 625 180 | 9/2 |
| 625 181 | 9/2 |
| 625 182 | 21/5 |
| 625 183 | 10/2 |
| 625 184 | 13/7 |
| 625 185 | 21/9 |
| 625 186 | 10/2 |
| 625 187 | 20/9 |
| 625 188 | 9/2 |
| 625 189 | 20/9 |
| 625 190 | 9/1 |
| 625 191 | 7/2 |
| 625 192 | 5/9 |
| 625 193 | 5/2 |
| 625 194 | 21/5 |
| 625 195 | 13/7 |
| 625 196 | 20/5 |
| 625 197 | 20/1 |
| 625 198 | 10/1 |
| 625 199 | 17/10 |
| 625 200 | 9/1 |
| 625 201 | 9/1 |
| 625 202 | 9/1 |
| 625 203 | 20/13 |
| 625 204 | 11/8 |
| 625 205 | 20/9 |
| 625 206 | 12/1 |
| 625 207 | 20/9 |
| 625 208 | 9/2 |
| 625 209 | 9/8 |
| 625 210 | 20/8 |
| 625 211 | 7/9 |
| 625 212 | 7/9 |
| 625 213 | 7/9 |
| 625 214 | 7/9 |
| 625 215 | 20/12 |
| 625 216 | 9/2 |
| 625 217 | 5/10 |
| 625 218 | 7/3 |
| 625 219 | 20/11 |
| 625 220 | 21/9 |
| 625 221 | 8/11 |
| 625 222 | 5/9 |
| 625 223 | 5/9 |
| 625 224 | 5/9 |
| 625 225 | 6/9 |
| 625 228 | 13/8 |
| 625 229 | 13/8 |
| 625 230 | 17/8 |
| 625 231 | 17/8 |
| 625 232 | 17/1 |
| 625 233 | 9/1 |
| 625 234 | 5/11 |
| 625 235 | 9/2 |
| 625 236 | 20/9 |
| 625 237 | 8/10 |
| 625 238 | 13/13 |
| 625 239 | 20/9 |
| 625 240 | 9/2 |

| | |
|---|---|
| 625 291 | 6/5 |
| 625 292 | 21/5 |
| 625 293 | 20/4 |
| 625 294 | 21/5 |
| 625 295 | 20/11 |
| 625 296 | 21/4 |
| 625 297 | 21/4 |
| 625 298 | 21/4 |
| 625 299 | 20/2 |
| 625 300 | 9/1 |
| 625 301 | 19/3 |
| 625 302 | 6/8 |
| 625 303 | 14/2 |
| 625 304 | 6/19 |
| 625 305 | 11/5 |
| 625 306 | 6/13 |
| 625 307 | 11/6 |
| 625 308 | 8/4 |
| 625 309 | 13/10 |
| 625 310 | 9/1 |
| 625 311 | 9/5 |
| 625 312 | 5/5 |
| 625 313 | 6/11 |
| 625 314 | 12/1 |
| 625 315 | 10/1 |
| 625 316 | 6/19 |
| 625 317 | 20/13 |
| 625 318 | 20/9 |
| 625 319 | 12/1 |
| 625 320 | 12/1 |
| 625 321 | 12/1 |
| 625 322 | 12/1 |
| 625 323 | 20/3 |
| 625 324 | 6/3 |
| 625 325 | 20/11 |
| 625 326 | 20/11 |
| 625 327 | 9/1 |
| 625 328 | 20/10 |
| 625 329 | 6/5 |
| 625 330 | 5/10 |
| 625 331 | 6/5 |
| 625 332 | 6/16 |
| 625 333 | 5/10 |
| 625 334 | 1/2 |
| 625 335 | 13/9 |
| 625 336 | 11/9 |
| 625 337 | 9/1 |
| 625 338 | 9/2 |
| 625 339 | 20/4 |
| 625 340 | 21/5 |
| 625 341 | 13/11 |
| 625 342 | 13/1 |
| 625 343 | 11/6 |
| 625 344 | 9/2 |
| 625 345 | 20/4 |
| 625 346 | 13/11 |
| 625 347 | 9/2 |
| 625 348 | 9/2 |
| 625 349 | 9/1 |
| 625 350 | 21/8 |
| 625 351 | 6/3 |
| 625 352 | 20/11 |
| 625 353 | 20/11 |
| 625 354 | 9/1 |
| 625 355 | 20/10 |
| 625 356 | 6/5 |
| 625 357 | 5/10 |
| 625 358 | 6/16 |
| 625 359 | 5/10 |
| 625 360 | 1/2 |
| 625 361 | 13/9 |
| 625 362 | 11/9 |
| 625 363 | 9/1 |
| 625 364 | 9/2 |
| 625 365 | 20/4 |
| 625 366 | 21/5 |
| 625 367 | 13/11 |
| 625 368 | 13/1 |
| 625 369 | 11/6 |
| 625 370 | 20/2 |
| 625 371 | 9/2 |
| 625 372 | 11/2 |
| 625 373 | 20/11 |
| 625 374 | 21/8.1 |
| 625 375 | 6/3 |
| 625 376 | 22/2 |
| 625 377 | 14/4 |
| 625 378 | 7/4 |
| 625 379 | 17/2 |
| 625 380 | 11/9 |
| 625 381 | 12/1 |
| 625 382 | 14/2 |
| 625 383 | 7/2 |
| 625 384 | 8/7 |
| 625 385 | 9/1 |
| 625 386 | 9/5 |
| 625 387 | 20/6 |
| 625 388 | 20/8 |
| 625 389 | 21/8 |
| 625 390 | 15/7 |
| 625 391 | 13/11 |
| 625 392 | 13/10 |
| 625 393 | 12/1 |
| 625 394 | 6/19 |
| 625 395 | 5/10 |
| 625 396 | 9/1 |
| 625 397 | 19/4 |
| 625 398 | 13/10 |
| 625 399 | 12/1 |
| 625 400 | 11/9 |
| 625 401 | 11/9 |
| 625 402 | 11/9 |
| 625 403 | 1/3 |
| 625 404 | 6/3 |
| 625 405 | 12/1 |
| 625 406 | 9/2 |
| 625 407 | 7/4 |
| 625 408 | 20/8 |
| 625 409 | 8/11 |
| 625 410 | 3/2 |
| 625 411 | 6/17 |
| 625 412 | 13/13 |
| 625 413 | 9/10 |
| 625 414 | 20/4 |
| 625 415 | 14/2 |
| 625 416 | 18/2 |
| 625 417 | 21/4 |
| 625 418 | 20/11 |
| 625 419 | 5/2 |
| 625 420 | 6/5 |
| 625 421 | 7/4 |
| 625 422 | 12/1 |
| 625 423 | 17/3 |
| 625 424 | 7/3 |
| 625 425 | 18/2 |
| 625 426 | 6/12 |
| 625 427 | 9/2 |
| 625 428 | 10/1 |
| 625 429 | 13/9 |
| 625 430 | 9/5 |
| 625 431 | 20/2 |
| 625 432 | 9/10 |
| 625 433 | 13/9 |
| 625 434 | 20/9 |
| 625 435 | 9/1 |
| 625 436 | 8/6 |
| 625 437 | 8/6 |
| 625 438 | 20/12 |
| 625 439 | 20/9 |
| 625 440 | 7/4 |
| 625 441 | 7/4 |
| 625 442 | 9/1 |
| 625 443 | 6/19 |
| 625 444 | 6/15 |
| 625 445 | 13/1 |
| 625 446 | 9/1 |
| 625 447 | 9/1 |
| 625 448 | 10/2 |
| 625 449 | 20/11 |
| 625 450 | 22/2 |
| 625 451 | 8/13 |
| 625 452 | 8/10 |
| 625 453 | 8/5 |
| 625 454 | 8/5 |
| 625 455 | 8/7 |
| 625 456 | 8/10 |
| 625 457 | 7/4 |
| 625 458 | 9/1 |
| 625 459 | 22/3 |
| 625 460 | 11/6 |
| 625 461 | 20/13 |
| 625 462 | 12/1 |
| 625 463 | 8/14 |
| 625 464 | 11/2 |
| 625 465 | 6/5 |
| 625 466 | 8/11 |
| 625 467 | 8/11 |
| 625 468 | 8/11 |
| 625 469 | 20/8 |
| 625 470 | 8/11 |
| 625 471 | 9/2 |
| 625 472 | 8/11 |
| 625 473 | 20/11 |
| 625 474 | 8/11 |
| 625 475 | 7/4 |
| 625 476 | 20/12 |
| 625 477 | 5/1 |
| 625 478 | 6/1 |
| 625 479 | 5/10 |
| 625 480 | 11/6 |
| 625 481 | 20/12 |
| 625 482 | 12/1 |
| 625 483 | 10/2 |
| 625 484 | 13/8 |
| 625 485 | 9/1 |
| 625 486 | 9/2 |
| 625 487 | 6/11 |
| 625 488 | 6/8 |
| 625 489 | 6/8 |
| 625 490 | 11/8 |
| 625 491 | 20/3 |
| 625 492 | 5/10 |
| 625 493 | 12/1 |
| 625 494 | 19/4 |
| 625 495 | 17/7 |
| 625 496 | 8/11 |
| 625 497 | 5/10 |
| 625 498 | 3/2 |
| 625 499 | 6/16 |
| 625 500 | 6/1 |
| 625 502 | 5/2 |
| 625 503 | 7/4 |
| 625 504 | 5/2 |
| 625 505 | 21/8 |
| 625 506 | 20/8 |
| 625 507 | 6/18 |
| 625 508 | 12/2 |
| 625 509 | 12/2 |
| 625 510 | 12/2 |
| 625 512 | 12/2 |
| 625 513 | 12/2 |
| 625 514 | 6/19 |
| 625 515 | 5/2 |
| 625 516 | 13/10 |
| 625 517 | 19/1 |
| 625 518 | 19/8 |
| 625 519 | 8/11 |
| 625 520 | 8/11 |
| 625 521 | 8/11 |
| 625 522 | 20/11 |
| 625 523 | 22/2 |
| 625 524 | 8/13 |
| 625 525 | 8/10 |
| 625 526 | 8/5 |
| 625 527 | 8/5 |
| 625 528 | 8/7 |
| 625 529 | 8/10 |
| 625 530 | 7/4 |
| 625 531 | 9/1 |
| 625 532 | 22/3 |
| 625 533 | 11/6 |
| 625 534 | 20/13 |
| 625 535 | 12/1 |
| 625 536 | 8/14 |
| 625 537 | 11/2 |
| 625 538 | 6/5 |
| 625 539 | 8/11 |
| 625 540 | 8/11 |
| 625 541 | 8/11 |
| 625 542 | 8/11 |
| 625 543 | 12/1 |
| 625 544 | 20/9 |
| 625 545 | 20/8 |
| 625 546 | 12/1 |
| 625 547 | 20/8 |
| 625 548 | 20/10 |
| 625 549 | 20/8 |
| 625 550 | 20/8 |
| 625 551 | 14/2 |
| 625 552 | 19/4 |
| 625 553 | 5/8 |
| 625 554 | 20/11 |
| 625 555 | 20/8 |
| 625 556 | 20/10 |
| 625 557 | 7/1 |
| 625 558 | 20/10 |
| 625 559 | 20/10 |
| 625 560 | 20/8 |
| 625 561 | 19/4 |
| 625 562 | 10/2 |
| 625 563 | 9/5 |
| 625 564 | 9/2 |
| 625 565 | 20/12 |
| 625 566 | 20/13 |
| 625 567 | 20/9 |
| 625 568 | 21/2 |
| 625 569 | 9/1 |
| 625 570 | 9/1 |
| 625 571 | 17/2.1 |
| 625 572 | 18/10 |
| 625 573 | 9/3 |
| 625 574 | 9/10 |
| 625 575 | 7/4 |
| 625 576 | 7/3 |
| 625 577 | 20/9 |
| 625 578 | 7/3 |
| 625 579 | 7/3 |
| 625 580 | 7/3 |
| 625 582 | 20/10 |
| 625 583 | 7/4 |
| 625 584 | 20/8 |
| 625 585 | 20/10 |
| 625 586 | 21/9 |
| 625 587 | 1/2 |
| 625 588 | 4/1 |
| 625 589 | 14/2 |
| 625 590 | 7/4 |
| 625 591 | 7/4 |
| 625 592 | 7/4 |
| 625 593 | 14/2 |
| 625 594 | 14/2 |
| 625 595 | 8/11 |
| 625 596 | 6/13 |
| 625 597 | 20/14 |
| 625 598 | 6/3 |
| 625 599 | 6/13 |
| 625 600 | 7/3 |
| 625 601 | 11/9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 625 619 | 13/10 | 625 627 | 6/3 | 625 638 | 7/3 | 625 649 | 7/3 |
| 625 619 | 19/2 | 625 628 | 6/13 | 625 639 | 7/4 | 625 650 | 7/3 |
| 625 616 | 6/13 | 625 629 | 6/13 | 625 640 | 6/3 | 625 651 | 6/13 |
| 625 617 | 6/13 | 625 630 | 6/13 | 625 641 | 6/3 | 625 652 | 14/4 |
| 625 620 | 6/13 | 625 631 | 6/13 | 625 642 | 6/13 | 625 653 | 6/3 |
| 625 621 | 9/2 | 625 632 | 6/13 | 625 643 | 7/4 | 625 654 | 12/1 |
| 625 622 | 20/4 | 625 633 | 6/3 | 625 644 | 6/3 | 625 655 | 6/13 |
| 625 623 | 6/13 | 625 634 | 7/3 | 625 645 | 6/13 | 625 656 | 20/4 |
| 625 624 | 6/3 | 625 635 | 7/3 | 625 646 | 7/4 | 625 657 | 6/13 |
| 625 625 | 6/3 | 625 636 | 7/3 | 625 647 | 6/13 | 625 658 | 19/1 |
| 625 626 | 6/1 | 625 637 | 7/3 | 625 648 | 7/3 | 625 659 | 19/1 |



799-657 O - 66 - 15

# OTHER RESEARCH REPORTS AND RELATED MATERIAL

## 1. AERONAUTICS

**AD-467 735** **Field 1C, 14E**
**CFSTI Prices: HC$1.00 MF$0.50**
Special Air Warfare Center, Elgin AFB, Fla. Combat Applications Group (1st).
**APCS TYPE IV CAMERA POD TEST.**
Final rept. 8 Jan-5 Feb 65,
May 65, 20p SAWC-TDR-65-5
Projs. 1CAG-2R-15, APCS-65-552
Distribution: No limitation.

Descriptors: (*External stores, Cameras), (*Attack bombers, External stores), Flight testing, Aerial photography, Aerial reconnaissance, Stability, Ordnance, Trajectories.

Identifiers: A-1 aircraft.

The Type IV camera pod was evaluated for adaptation to the A-1E aircraft. Flight tests to evaluate camera pod steadiness were flown with the pod mounted on the No. 3 outboard station, the left inboard station, and the centerline station. After confirmation of minimal pod and camera vibration on these three stations, additional flight tests were conducted to photograph the trajectory and impact of various types of ordnance released from the camera pod test aircraft. The camera pod photographic coverage of ordnance delivery was accomplished with forward and aft facing, 16 mm, Milliken DB-5 motion picture cameras. The Type IV camera pod was successfully tested to obtain chase aircraft photography of ordnance delivery from other aircraft. Camera depression angles and lens focal length varied, depending on the photographic coverage requirement for different types of ordnance delivery. The standard armament system wiring on the test A-1E aircraft was augmented to facilitate automatic camera operation when any one of the three ordnance release circuits was activated. The Type IV camera pod produces acceptable aerial motion picture photography when mounted on either the No. 3 or No. 4 wing stations or an inboard pylon station on the A-1E aircraft. (Author)

**AD-472 659** **Field 1A**
**CFSTI Price: HC$1.00**
RAND Corp., Santa Monica, Calif.
**BOUNDARY-LAYER FLOWS WITH LARGE INJECTION RATES,**
by Jerome Aroesty and Julian D. Cole. Aug 65, 25p RM-4620-ARPA
Contract SD-79; ARPA Order-189-61
Distribution: No limitation.

Descriptors: (*Laminar flow, Mass transfer), (*Laminar boundary layer, Mass transfer), Injection, Convection, Fluid mechanics, Approximation (Mathematics).

A consideration of the problem of the constant-property laminar boundary-layer flow with large mass-injection rates and favorable pressure gradient. Approximate solutions for the structure of blowing-induced shear layers are obtained for flows that satisfy the requirements of Falkner-Skan similarity. For small pressure gradients, the asymptotic structure is shown to consist of a viscous shear layer imbedded in an inviscid flow. A preliminary analysis of the natural-convection problem with large injection is performed, and the way in which the ideas used in the Falkner-Skan analysis may be extended to this problem is suggested. (Author)

**AD-491 714** **Field 1C, 11F**
**CFSTI Prices: HC$7.00 MF$1.75**
RAND Corp., Santa Monica, Calif.
**AN APPRAISAL OF THE USEFULNESS OF ALUMINUM ALLOYS FOR AIRCRAFT AND SUPERSONIC VEHICLE CONSTRUCTION.**
Technical survey rept.,
by C. M. Craighead, L. W. Eastwood, and C. H. Lorig. 2 Aug 48, 394p
Subcontracted to Battelle Memorial Inst., Columbus, Ohio., Rept. no. G-1112-11. Distribution: No limitation.

Descriptors: (*Aluminum alloys, Airframes), (*Airframes, Aluminum alloys), (*Supersonic planes, Airframes), Lowtemperature research, Mechanical properties, Hightemperature research, Tables, Tensile properties, Creep strength, Fatigue (Mechanics), Loading (Mechanics), Corrosion, Structural properties.

The primary objective of this survey is directed toward an appraisal of aluminum for use in supersonic vehicles. In such applications, a knowledge of how the materials of construction are affected by temperatures is essential, for temperatures may range from sub-atmospheric, such as that of liquid hydrogen to extremely high values well above the melting points of the ordinary metals and alloys. In some circumstances the exposure may be very short, or again of prolonged duration. With these requirements in mind, data on the properties of aluminum alloys, as affected by temperature, are assembled from the various sources. Within the body of this report, the limitations of existing information are pointed out, consideration is given to such research and development work as is known to be in progress in the various fields, and an engineering appraisal of possible future developments in aluminum alloys is postulated. In so far as data are available, some consideration is also given to corrosion characteristics of aluminum and its alloys in special media (propellants). (Author)

**N65-16990** **Field 1B, 22A**
**CFSTI Prices: HC$2.00 MF$0.50**
Indiana Univ. Foundation, Bloomington. Aerospace Research Applications Center.
**ARAC OPERATING MANUAL DESCRIBING ARAC SERVICES TO MEMBER COMPANIES,**
by A. M. Weimer. Oct 63, 45p
Contract NASR162
NASA CR-52472
Distribution: No limitation.

Descriptors: (*Aeronautics, Bibliographies), (*Astronautics, Bibliographies).

**N65-16991** **Field 1B, 22A**
**CFSTI Prices: HC$2.00 MF$0.50**
Indiana Univ. Foundation, Bloomington. Aerospace Research Applications Center.
**ARAC SERVICES TO MEMBER COMPANIES.**
Quarterly operating manual no. 2, Jul-Sep 63.
Sep 63, 37p
Contract NASR162
NASA CR-51721
Distribution: No limitation.

Descriptors: (*Aeronautics, Bibliographies), (*Astronautics, Bibliographies).

**N65-20163** **Field 1-, 22**
**CFSTI Prices: MF$5.00**
National Aeronautics and Space Administration, Washington, D. C.
**A SELECTED LISTING OF NASA SCIENTIFIC AND TECHNICAL REPORTS FOR 1964.**
1965, 1137p NASA-SP-7018
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C. $5.25. Distribution: No limitation.

Descriptors: (*Aeronautics, Reports), (*Spacecraft, Reports).

Identifiers: National Aeronautics and Space Administration.

**N65-21764** **Field 1D, 22C**
**CFSTI Prices: HC$4.00 MF$0.75**
Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
**INVESTIGATION OF OPTIMIZATION OF ATTITUDE CONTROL SYSTEMS. VOLUME II,**
by R. Sridher, G. C. Agarwal, R. M. Burns, D. M. Detchmendy, and E. H. Kopf, Jr. Jan 65, 108p
Rept. nos. TR-EE65-4, PRF-3807-55-285
Contracts NAS7 100, JPL950670
NASA CR-62243
Distribution: No limitation.

Descriptors: (*Attitude control systems, Optimization).

**N65-23119** **Field 1A, 20A**
**CFSTI Prices: HC$1.00 MF$0.50**
Wyle Labs., Inc., El Segundo, Calif.
**AERODYNAMIC NOISE RESEARCH SUPPORT.**
Quarterly progress rept., Jan-Mar 65,
by M. V. Lowson. 9 Apr 65, 23p
Contract NAS8-11308
NASA CR-62497
Distribution: No limitation.

Descriptors: (*Noise, Aerodynamic characteristics), (*Aerodynamic characteristics, Noise).

**N65-23918** **Field 1D**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
**LOW-SPEED INVESTIGATION OF HIGH-LIFT AND LATERAL CONTROL DEVICES ON A SEMISPAN VARIABLE-SWEEP WING HAVING AN OUTBOARD PIVOT LOCATION,**
by William P. Henderson and Alexander D. Hammond. May 61, 39p NASA-TM-X-542
Distribution: No limitation.

Descriptors: (*Variable-sweep wings, Flight control systems).

**N65-23921** **Field 1C**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**COMPARISON OF FULL-SCALE LIFT AND DRAG CHARACTERISTICS OF THE X-15 AIRPLANE WITH WIND-TUNNEL RESULTS AND THEORY,**
by Edward J. Hopkins, David E. Fetterman, Jr., andEdwin J. Saltzman. 1 Mar 62, 18p NASA-TM-X-713
Distribution: No limitation.

Descriptors: (*Research planes, Aerodynamics characteristics).

**N65-23922** **Field 1C**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration. Edwards, Calif. Flight Research Center.
**STABILITY AND CONTROL DERIVATIVE CHARACTER- ISTICS OF THE X-15 AIRPLANE,**
by Harold J. Walker and Chester H. Wolowicz. Mar 62, 31p NASA-TM-X-714
Distribution: No limitation.

Descriptors: (*Research planes, Stability), (*Aerospace planes, Stability).

Identifiers: X-15 aircraft.

**N65-23925** **Field 1B**
**CFSTI Prices: HC$5.00 MF$1.25**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**INVESTIGATION OF THE AERODYNAMIC CHARACTERISTICS OF A 0.02-SCALE MODEL OF THE X-15 AIRPLANE AT MACH NUMBERS OF 2.96, 3.96, AND 4.65 AT HIGH ANGLES OF ATTACK,**
by Royce L. McKinney and Julia A. Lancaster. Jun 63, 192p NASA-TM-X-820
Distribution: No limitation.

Descriptors: (*Research planes, Aerodynamic characteristics).

Identifiers: X-15 aircraft.



799-657 O - 66 - 16

N65-24100 Field 1A, 1C
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautic and Space Administration, Langley Station, Va. Langley Research Center.
**AN EXPLORATORY INVESTIGATION OF THE LOW- SPEED AERO-DYNAMIC CHARACTERISTICS OF VARIABLE-WING-SWEEP AIRPLANE CONFIGURATIONS,**
by William J. Alford, Jr. and William P. Henderson. Sep 59, 24p NASA-TMX-142
Distribution: No limitation.

Descriptors: (*Variable-sweep wings, Subsonic characteristics).

N65-28135 Field 1A, 1C
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**EFFECTS OF SIMULATED ROCKET-JET EXHAUST ON STABILITY AND CONTROL OF A RESEARCH-TYPE AIRPLANE CONFIGURATION AT A MACH NUMBER 6.86,**
by David E. Fetterman, Jr. Oct 59, 36p Rept. no. TMX-127
Distribution: No limitation.

Descriptors: (*Exhaust gases, Rockets), (*Aerodynamic characteristics, Research planes).

N65-33834 Field 1B
CFSTI Prices: HC$3.00 MF$0.50
Pratt and Whitney Aircraft, East Hartford, Conn.
**INLET-TO-INLET SHOCK INTERFERENCE TESTS.**
Final rept.,
by D. L. Motycka and J. B. Murphy. Sep 65, 54p Contract NAS2-2079
NASA CR-264
Distribution: No limitation.

Descriptors: (*Shock (Mechanics), Supersonic planes), (*Supersonic planes, Aerodynamic characteristics).

N65-33836 Field 1B
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**EFFECT OF REARWARD BODY STRAKES ON THE TRANSONIC AERODYNAMIC CHARACTERISTICS OF AN UNSWEPT-WING FIGHTER AIRCRAFT,**
by C. Robert Carter. Sep 65, 39p
NASA TND-3011
Distribution: No limitation.

Descriptors: (*Fighters, Transonic characteristics).

N65-33837 Field 1A, 21H
CFSTI Prices: HC$3.00 MF$0.50
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
**INVESTIGATION OF EXHAUST BACKFLOW FROM A SIMULATED CLUSTER OF THREE WIDE-SPACE ROCKET NOZZLES IN A NEAR-SPACE ENVIRONMENT,**
by James M. Cubbage. Sep 65, 59p
NASA TN-D-3016
Distribution: No limitation.

Descriptors: (*Rocket motor nozzles, Exhaust gases).

N65-33839 Field 1C, 16A
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Edwards, Calif. Flight Research Center.
**EVALUATION OF THE LATERAL-DIRECTIONAL STABILITY AND CONTROL CHARACTERISTICS OF THE LIGHTWEIGHT M2-F1 LIFTING BODY AT LOW SPEEDS,**
by Harriet J. Smith. Sep 65, 36p
NASA TND-3022
Distribution: No limitation.

Descriptors: (*Guided missile launchers, Fighters).

N65-33840 Field 1A
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**UNSTEADY VISCOUS VORTEX WITH FLOW TOWARD THE CENTER,**
by Robert G. Deissler. Sep 65, 18p
NASA TN-D-3026
Distribution: No limitation.

Descriptors: (*Vortices, Analysis).

N65-33967 Field 1C
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Moffett Field, Calif. Ames Research Center.
**ANALYTICAL INVESTIGATION OF A HELICOPTER ROTOR DRIVEN AND CONTROLLED BY A JET FLAP,**
by William T. Evans and John L. McCloud III. Sep 65, 49p
NASA TN-D-3028
Distribution: No limitation.

Descriptors: (*Helicopter rotors, Jet flaps), (*Jet flaps, Helicopter rotors).

N65-34222 Field 1A
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
**EFFECT OF WING PLANFORM MODIFICATION ON LONGITUDINAL CHARACTERISTICS OF A VARIABLESWEEP M WING,**
by Edward J. Ray and William P. Henderson. Oct 65, 28p
NASA TND-3025
Distribution: No limitation.

Descriptors: (*Swept wings, Aerodynamic characteristics).

N65-34437 Field 1C
CFSTI Prices: HC$3.00 MF$0.50
National Aeronautics and Space Administration. Edwards, Calif. Flight Research Center.
**FLIGHT PRESSURE DISTRIBUTIONS ON THE VERTICAL STABILIZERS AND SPEED BRAKES OF THE X-15 AIRPLANE AT MACH NUMBERS FROM 1 TO 6,**
by Jon S. Pyle. Oct 65, 56p NASA-TN-D-3048
Distribution: No limitation.

Descriptors: (*Research planes, Stability), (*Aerospace planes, Stability).

Identifiers: X-15 aircraft.

N65-34504 Field 1A
CFSTI Prices: HC$3.00 MF$0.75
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
**SEMIEMPIRICAL METHOD FOR PREDICTING EFFECTS OF INCIDENT-REFLECTING SHOCKS ON THE TURBULENT BOUNDARY LAYER,**
by S. Z. Pinckney. Oct 65, 101p
NASA TND-3029
Distribution: No limitation.

Descriptors: (*Turbulent boundary layer, Shock waves), (*Shock waves, Mathematical prediction).

N65-34905 Field 1A
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**STATIC STABILITY CHARACTERISTICS OF SEVERAL RAKED-OFF CIRCULAR AND ELLIPTICAL CONES AT MACH 6.7,**
by Peter T. Bernot. Oct 65, 24p NASA-TND-3053
Distribution: No limitation.

Descriptors: (*Conical bodies, Hypersonic characteristics).

N65-35057 Field 1A
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**EFFECTS OF LEADING-EDGE BLUNTNESS ON PRESSURE AND HEAT-TRANSFER MEASUREMENTS OVER A FLAT PLATE AT A MACH NUMBER OF 20,**
by William D. Harvey. Oct 65, 43p NASA-TND-2846
Distribution: No limitation.

Descriptors: (*Leading edge, Hypersonic characteristics), (*Flat plate models, Hypersonic characteristics).

N65-35064 Field 1A
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**EFFECTS OF THICKNESS ON SUPERSONIC PERFORMANCE OF A WING-BODY CONFIGURATION EMPLOYING A WARPED HIGHLY SWEPT ARROW WING,**
by F. Edward McLean and Dennis E. Fuller. Oct 65, 30p NASA-TND-3034
tion.

Descriptors: (*Wing-body configurations, Thickness), (*Supersonic characteristics, Swept wings).

N65-35065 Field 1A
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**AERODYNAMIC CHARACTERISTICS IN PITCH OF SEVERAL M-WING-BODY COMBINATIONS AT MACH NUMBERS OF 2.40, 2.60, AND 2.86,**
by Odell A. Morris and F. Edward McLean. Oct 65, 35p NASA-TND-3035
Distribution: No limitation.

Descriptors: (*Wing-body configurations, Aerodynamic characteristics).

N65-35403 Field 1C
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**FLIGHT TESTS OF A ONE-MAN HELICOPTER AND A COMPARISON OF ITS HANDLING QUALITIES WITH THOSE OF LARGER VTOL AIRCRAFT,**
by Terrell W. Feistel and Fred J. Drinkwater, III. Oct 65, 17p NASA-TND-3060
Distribution: No limitation.

Descriptors: (*Vertical take-off planes, Aerodynamic characteristics), (*Helicopters, Aerodynamic characteristics).

N65-35404 Field 1A
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**LATERAL DIRECTIONAL STABILITY CHARACTERISTICS AT MACH 2.3 TO 3.5 OF**

**A SUPERSONIC TRANSPORT MODEL WITH VARIOUS OUTBOARD VERTICAL-TAIL LOCATIONS,**
by William A. Corlett. Oct 65, 33p NASA-TMX-1151
Distribution: No limitation.

Descriptors: (*Supersonic planes, Roll), (*Transport planes, Roll).

**N65-35522** **Field 1A**
**CFSTI Prices: HC$1.00 MF$0.50**
McDonnell Aircraft Corp., St. Louis, Mo.
**A WAVE-GUIDE MODEL FOR TURBULENT SHEAR FLOW,**
by Marten T. Landahl. Oct 65, 24p
Contract NAS1-3179
NASA CR-317
Distribution: No limitation.

Descriptors: (*Turbulent boundary layer, Propagation).

**Patent 3,218,007** **Field 1C, 11E**
**PARACHUTE STABILITY IMPROVEMENTS.**
Patent assigned to Air Force,
by Reinhold J. Gross. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Parachutes, Stability), Textiles, Design, Patents.

The parachute has a canopy comprising a plurality of 'solid' or low porosity parachute fabric gores, and similar shaped more porous segment-shaped gores, alternately connected between the solid low porosity fabric gores, to form a parachute canopy having a plurality of circumferentially equally spaced solid low porosity fabric gores with radially spaced more porous similarly shaped gore segments therebetween.

**PB-168 764** **Field 1A, 20D**
**CFSTI Prices: HC$3.00 MF$0.75**
Lehigh Univ., Bethlehem, Pa. Inst. of Research.
**A TRACER STUDY OF THE SHOCK TUBE BOUNDARY LAYER.**
Doctoral thesis,
by Edmund J. Gion. 15 Sep 65, 84p Technical rept. TR-18
Grant NSF-GP-2366
Distribution: No limitation.

Descriptors: (*Boundary layer, Tracer studies), Shock tubes, Spark shadowgraph photography, Laminar flow, Turbulent boundary layer.

A dark field oscillatory spark microphotographic technique combined with submicron sized oil drop tracers was used to study with fine detail and accuracy the structure of the boundary layer growing on the shock tube wall. Laminar mean velocity profiles were found to be in agreement with theoretical expectations. Turbulent mean profiles are fitted by 1/5th to 1/7th power curves. Indications of gas slip at the wall were found in the laminar flow close behind the shock. Parallel and perpendicular (to wall) components of turbulent velocity fluctuations were measured. These qualitatively exhibit the same trends with increasing distance from the wall as those of steady wind tunnel work. Angular distributions of tracer velocity deviations from parallel to the wall in a turbulent boundary layer are given. The maximum angular deviations plotted as a function of nondimensional distance from the wall agree with steady pipe flow data near the wall. The similarity of the shock tube boundary layer to the steady flat plate boundary layer is indicated by all the present findings. A persistence of laminar flow was found for times long after transition to turbulence has occurred for most other reported work. (Author)

## 3. ASTRONOMY AND ASTROPHYSICS

**N65-16434** **Field 3B**
**CFSTI Prices: HC$3.00 MF$0.50**
Illinois Univ., Urbana.
**F-REGION IRREGULARITIES STUDIED BY SCINTILLATION OF SIGNALS FROM SATELLITES,**
by G. W. Swenson, Jr., and K. C. Yeh. 1963, 59p
Grant NsG-24-59
NASA CR-53493
Distribution: No limitation.

Descriptors: (*Ionosphere, Scintillation), (*Radio signals, Ionosphere).

**N65-16477** **Field 3A**
**CFSTI Prices: HC$3.00 MF$0.75**
Aeromedical Research Lab. (6571st), Holloman AFB, N. Mex.
**MEASUREMENT OF SOLAR FLARE PRODUCED COSMIC RADIATION.**
by D. J. Corkhill, R. A. Hoffman, and R. J. Lockhart. Oct 62, 77p ARL-TDR-62-24
Contract NASA Order R-12
NASA CR-50114
Distribution: No limitation.

Descriptors: (*Cosmic rays, Measurement), (*Solar flares, Cosmic rays).

**N65-17279** **Field 3B**
**CFSTI Prices: HC$2.00 MF$0.50**
Michigan Univ., Ann Arbor. Radio Astronomy Observatory.
**COSMIC RADIO INTENSITIES AT 1.225 AND 2.0 MEGACYCLES/SEC MEASURED UP TO AN ALTITUDE OF 1700 KILOMETERS,**
by D. Walsh, F. T. Haddock, and H. F. Schulte. 1963, 37p
Grant NASw54
NASA CR-60780
Distribution: No limitation. Presented at the COSPAR Plenary Meeting (6th) and International Space Science Symposium (4th), Warsaw, Poland, Jun 63.

Descriptors: (*Radio astronomy, Low frequency), (*Low frequency, Radio astronomy).

**N65-17281** **Field 3B**
**CFSTI Prices: HC$1.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge.
**RESULTS ON GAMMA-RAY ASTRONOMY FROM EXPLORER XI,**
by G. W. Clark and W. L. Kreushaar. 1964, 23p
Contract NASw37
NASA 60785
Distribution: No limitation.

Descriptors: (*Cosmic rays, Gamma-ray spectroscopy), (*Gamma-ray spectroscopy, Cosmic rays).

Identifiers: Explorer.

**N65-17610** **Field 3B**
**CFSTI Prices: HC$6.00 MF$1.50**
Aerojet-General Corp., Azusa, Calif.
**SPACE ENVIRONMENT CRITERIA - SPACE ENVIRONMENT BIBLIOGRAPHY.**
Semiannual rept. no. 2979,
by R. L. Buller and W. W. Howard. 3 Feb 65, 298p
Contract NAS8-11285
NASA CR-61037
Distribution: No limitation.

Descriptors: (*Space environmental conditions, Bibliographies).

**N65-18484** **Field 3A**
**CFSTI Prices: HC$2.00 MF$0.50**
Smithsonian Inst., Cambridge, Mass. Astro-physical Observatory.
**A CATALOG OF POSITIONS AND PROPER MOTIONS OF 258 997 STARS FOR THE EPOCH AND EQUINOX OF 1950.0.**
5 May 64, 49p Special rept. no. 151
Grant NsG87 60
NASA CR-57119
Distribution: No limitation.

Descriptors: (*Stars, Catalogs), (*Astronomy, Stars).

**N65-18918** **Field 3B**
**CFSTI Prices: HC$3.00 MF$0.75**
Princeton Univ., Observatory, N. J.
**HYDROGEN MOLECULES AND ASTRONOMY: A REVIEW,**
by W. B. Somerville, G. B. Field, and K. Dressler. Jan 65, 90p
Grant NsG-414
NASA CR-57156
Distribution: No limitation.

Descriptors: (*Astronomy, Hydrogen), (*Hydrogen, Astronomy).

**N65-18937** **Field 3A**
**CFSTI Prices: HC$3.00 MF$0.75**
Arizona Univ., Tucson.
**COMMUNICATIONS OF THE LUNAR PLANETARY LABORATORY, VOLUME 3, NO. 40: THE SYSTEM OF LUNAR CRATERS, QUADRANT II,**
by D. W. G. Arthur, Alice P. Agnieray, Ruth A. Horvath, C. A. Wood, and C. R. Chapman. 1964, 78p
Grant NsG-161
NASA CR-57208
Distribution: No limitation.

Descriptors: (*Moon, Terrain).

**N65-18944** **Field 3B**
**CFSTI Prices: HC$1.00 MF$0.50**
Stanford Univ., Calif. Radioscience Lab.
**RESEARCH AT THE STANFORD CENTER FOR RADAR ASTRONOMY.**
Semiannual rept. no. 4, 1 Jul-31 Dec 64,
by V. R. Eshleman. Jan 65, 11p
Grant NsG377,
Proj. SEL5208
NASA CR-57184
Distribution: No limitation.

Descriptors: (*Radio astronomy, Reports).

**N65-19960** **Field 3B**
**CFSTI Prices: HC$3.00 MF$0.50**
Naval Research Lab., Washington, D. C.
**OBSERVATIONS OF THE WHITE LIGHT CORONA FROM A ROCKET,**
by H. W. Cooper, C. R. Detweiler, M. J. Koomen, D. M. Packer, and J. D. Purcell. Feb 64, 57 p
NASA Order R-70
Contract S14704G
NASA CR-53537
Distribution: No limitation. Microfilmed from best available copy.

Descriptors: (*Solar corona, Rockets), (*Rockets, Data).

**N65-20422** **Field 3B**
**CFSTI Prices: HC$1.00 MF$0.50**
Douglas Aircraft Co., Inc., Santa Monica. Calif Missile and Space Systems Div.
**EXPERIMENTAL INVESTIGATION OF ULTRA-HIGH VACUUM ADHESION AS RELATED TO THE LUNAR SURFACE.**
No. 2 Quarterly Progress Rept. 1 Oct-31 Dec 64,
by J. A. Ryan. 26 Jun 64, 22p A260-BBK2-57
Contract NAS7-307
NASA CR-57631
Distribution: No limitation.

Descriptors: (*Moon, Surface properties).

N65-20758 Field 3B
CFSTI Prices: HC$4.00 MF$1.00
TRW Space Technology Labs., Redondo Beach, Calif.
**THEORETICAL INVESTIGATION: THE SCATTERING OF LIGHT BY A PLANETARY ATMOSPHERE.**
Final rept. for 1 Jun-Dec 64,
by Robert S. Fraser. 1 Dec 64, 125p Rept. no. 4167 6002-RU-000
Contract NAS5 3891
NASA CR-57740
Distribution: No limitation.

Descriptors: (*Planetary atmospheres, Light transmission), (*Light transmission, Planetary atmospheres).

N65-21326 Field 3B
CFSTI Prices: HC$1.00 MF$0.50
General Dynamics/Astronautics, San Diego, Calif.
**EXPERIMENTS TO EXAMINE THE PREDICTABILITY OF SOLAR DATA WITH EMPHASIS ON FLARES.**
Bi-Monthly progress rept. no. 4 for 3 Dec 64-3 Feb 65,
3 Feb 65, 15p GD/A DBA64-009-02
Contract NAS5-3907
NASA CR-57953
Distribution: No limitation.

Descriptors: (*Solar flares, Mathematical prediction).

N65-21475 Field 3B
CFSTI Prices: HC$3.00 MF$0.75
California Univ., La Jolla.
**A STUDY OF THE VELOCITY FIELD IN M 82 AND ITS BEARING ON EXPLOSIVE PHENOMENA IN THAT GALAXY,**
by E. Margaret Burbidge, G. R. Burbidge, and Vera C. Rubin. May 64, 66p
Grant NsG357
NASA CR-56594
Prepared in cooperation with McDonald Observatory, Univ. of Texas. Distribution: No limitation.

Descriptors: (*Galaxies, Spectroscopy), (*Astrophysics, Galaxies).

N65-21671 Field 3B
CFSTI Prices: HC$2.00 MF$0.50
Michigan Univ. Observatory, Ann Arbor.
**THE ORIGIN OF SOLAR FLARES AND THE ACCELERATION OF CHARGED PARTICLES,**
by Donat G. Wenzel. 1963, 33p
NASA TM-X-5521;
NASA X-640-63-204
Distribution: No limitation.

Descriptors: (*Solar flares, Plasma physics).

N65-21718 Field 3A
CFSTI Prices: HC$2.00 MF$0.50
Florida State Univ., Tallahassee. Radio Astronomy Observatory.
**RADIO ASTRONOMY PROGRAMME.**
Status rept. no. 6 (final), Suppl. for 1 Aug 64-31 Jan 65,
by C. H. Barrow. 31 Jan 65, 50p Rept. no. 031265
Grant NsG224 61
NASA CR-62200
Distribution: No limitation.

Descriptors: (*Radio astronomy, Research program administration).

N65-22171 Field 3B
CFSTI Prices: HC$1.00 MF$0.50
Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
**STUDY OF LUNAR REFLECTIVE COMPONENTS OF SOLAR RADIO EMISSION.**
Semiannual status rept.,
by G. R. Cooper and C. D. McGillem. 28 Feb 65, 15p
Grant NsG543
NASA CR-62349
Distribution: No limitation.

Descriptors: (*Solar radiation, Scattering), (*Moon, Surface properties).

N65-25009 Field 3B
CFSTI Prices: HC$2.00 MF$0.50
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
**ATMOSPHERIC OSCILLATIONS,**
by A. J. Lineberger and H. D. Edwards. Apr 65, 33p
Contracts NsG-304-63, AF19 (628)-393,
Proj. A-652-001
NASA CR-62898
Distribution: No limitation.

Descriptors: (*Atmospheric motion, Oscillation).

N65-27390 Field 3B
CFSTI Prices: HC$4.00 MF$1.00
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York, N. Y.
**EXTRA GALACTIC RADIO SOURCES,**
by Wolfgang Priester and Johan Rosenberg. 1964, 132p
NASA TM-X-56586
Distribution: No limitation.

Descriptors: (*Radio astronomy, Galaxies), (*Galaxies, Radio astronomy).

N65-32183 Field 3C
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Greenbelt, Md. Goddard Space Flight Center.
**TWO-CENTER PROBLEM ORBITS AS INTERMEDIATE ORBITS FOR THE RESTRICTED THREE-BODY PROBLEM,**
by R. G. Langebartel. Sep 65, 19p NASA-TN-D-2939
Distribution: No limitation.

Descriptors: (*Celestial mechanics, N-body problem).

Identifiers: Restricted three body problem.

N65-34232 Field 3B, 8G
CFSTI Prices: HC$1.00 MF$0.50
Nuclide Corp., State College, Pa.
**THE DISTINCTION OF ROCK TYPES ON THE BASIS OF THEIR MASS SPECTRA, WITH SPECIAL REFERENCE TO LUNAR-SURFACE APPLICATIONS,**
by Werner G. Deuser. Sep 65, 20p
Contract NASw-1062
NASA CR-310
Distribution: No limitation.

Descriptors: (*Moon, Petrology), (*Petrology, Moon).

N65-34244 Field 3B
CFSTI Prices: HC$6.00 MF$1.50
Aerojet-General Corp., Azusa, Calif.
**ENGINE OPERATING PROBLEMS IN SPACE. THE SPACE ENVIRONMENT,**
by D. Christensen. Sep 65, 228p
Contract NAS7-98
NASA CR-294
Distribution: No limitation.

Descriptors: (*Space environmental conditions, Reports).

## 4. ATMOSPHERIC SCIENCES

AD-466 999 Field 4B
CFSTI Prices: HC$1.00 MF$0.50
Army Electronics Research and Development Activity, White Sands Missile Range, N. Mex. Environmental Sciences Directorate.
**WIND OSCILLATIONS BETWEEN 30 AND 60 KILOMETERS OVER WHITE SANDS MISSILE RANGE, NEW MEXICO,**
by Bruce T. Miers. Jul 65, 21p ERDA-312
Proj. DA-1L13001A91A
Distribution: No limitation.

Descriptors: (*Stratosphere, Wind), Oscillation, Errors, Sounding rockets, New Mexico, Diurnal variations, Measurement, Solar radiations, Measurement, Solar radiation, Ozone, Low frequency, Rotation, Harmonic analysis, Radiosondes.

Analyses of three series of meteorological rocket soundings have indicated diurnal and semidiurnal cycles in the winds between 30 and 60 km. Each series was a one-day sample with the soundings over White Sands Missile Range taken on 7-8 February 1964 and 21-22 November 1964 being compared with the soundings taken over Eglin AFB, Florida on 9-10 May 1961. In general the winds turned clockwise for the periods of time examined, indicating a diurnal cycle in the wind field. In most cases the amplitude of the diurnal component was larger than the amplitude of the semidiurnal component, with the diurnal component undergoing systematic fluctuations with height. It was found that the diurnal and semi-diurnal oscillations were not uniform but occurred in layers of strong and weak oscillations with different phases in the different layers. The largest amplitudes occurred at 45 km where the heating of the ozone by solar ultraviolet is a maximum. (Author)

C13.46:18-20 Field 4A, 17B, 20N
CFSTI Price: MF$0.75
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**QUARTERLY RADIO NOISE DATA, SEPTEMBER, OCTOBER, NOVEMBER 1963.**
Technical note,
by W. Q. Crichlow, R. T. Disney and M. A. Jenkins
23 Oct 64, 97p NBS-TN-18-20
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50.

Descriptors: (*Atmospherics, Tables), (*Radio interference, Atmospherics), Global communication systems, Geophysics.

Radio noise measurements were made at eighteen stations in a world-wide network operated in a cooperative program co-ordinated by the National Bureau of Standards. The locations of these stations are shown on a map. The tabulated values are based on three basic parameters of the noise; these are the mean power, the mean envelope voltage and the mean logarithm of the envelope voltage.

C13.46:209 Field 4A
CFSTI Prices: HC$0.20 MF$0.50
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**CALCULATION OF SUNRISE AND SUNSET TIMES AT IONOSPHERIC HEIGHTS ALONG A GREAT CIRCLE PATH.**
Technical note,
by A. H. Brady and D. D. Crombie. 8 Nov 64, 19p NBS-TN-209
N65 18058
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.20.

Descriptors: (*Sky brightness, Diurnal variations), (*Sun, Sky brightness), Solar radiation, Ionosphere, Optical properties, Mathematical prediction, Computers, Very low frequency, Radio transmission.

Formulae for determining the coordinates of points along a specified great circle path and for determining the times of sunset and sunrise at these points are given. A computer program for making the calculations and showing which portions of a great circle path are illuminated is outlined. Some illustrations of the dependence of VLF phase delay on path illumination are also given. (Author)

**C13.46:305** **Field 4A, 20N**
**CFSTI Price: MF$1.00**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**ATLAS OF FOURIER COEFFICIENTS OF DIURNAL VARIATION OF foF2, PART II. DISTRIBUTION OF AMPLITUDE AND PHASE.**
Technical note,
by William B. Jones and Roger M. Gallet. 14 Feb 65, 118p NBS-TN-305
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.

Descriptors: (*Ionosphere, Diurnal variations), Electron density, Solar disturbances, Radio transmission, Correlation techniques, Harmonic analysis, Fourier analysis.

This atlas is devoted to the study of amplitude and phase from the diurnal analysis of foF2 monthly median. It is concerned with their variations - both systematic and random - as functions of latitude, season and solar activity. The atlas contains a series of graphs of the distribution of amplitude and phase and tables of phase distribution for four seasonal months of high and low years of solar activity. Emphasis is placed on the study of the phase distributions for determining the optimum separation of harmonics produced mainly by noise from those representing mostly real physical variation. (Author)

**C13.46:306** **Field 4A, 20N**
**CFSTI Price: MF$1.00**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**STUDIES OF SOLAR FLARE EFFECTS AND OTHER IONOSPHERIC DISTURBANCES WITH A HIGH FREQUENCY DOPPLER TECHNIQUE.**
Technical note,
by V. Agy, D. M. Baker, and R. M. Jones. 28 Apr 65, 158p TN-306
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.75.

Descriptors: (*Solar flares, Doppler effect), (*Ionospheric disturbances, Doppler effect), (*Doppler systems, Atmospheric sounding), (*Atmospheric sounding, Doppler systems), Geophysics, Atmosphere.

This report presents some results of work done with a Doppler technique for studying ionospheric disturbances. The theoretical results include a calculation of the frequency shifts to be expected from changes in the parameters of a parabolic model ionosphere and a method of determining the height variation of the time rate of change of electron density during ionospheric disturbances. It is shown that the frequency shift, with oblique propagation, is the same as that with vertical propagation on the equivalent vertical-incidence frequency. The experimental results include a comprehensive catalog of all flare effects observed from 1 October 1960 thorugh 31 December 1962, a statistical study of these flare effects, and the Doppler records of some solar flare effects detected during this period. A model in which the time rate of change of electron density is zero below the bottom of the E layer, and constant above that height, explains the frequency dependence of the maximum Doppler shifts observed during some solar flares. (Author)

**C13.46:308** **Field 4A**
**CFSTI Prices: HC$0.50 MF$0.75**
National Bureau of Standards, Boulder, Colo.
**DATA REDUCTION FOR STABLE AURORAL RED ARCS OBSERVED AT RAPID CITY, SOUTH DAKOTA.**
Technical note,
by J. E. Cruz, Robert Davies, L. K. Droppleman, E. Marovich, and L. R. Megill. 3 May 65, 57p NBS-TN-308
Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50.
Distribution: No limitation.

Descriptors: (*Aurorae, Optical properties), (*Sky brightness, Mapping), Optical instruments, South Dakota.

**N65-15382** **Field 4A, 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
California U., La Jolla. Dept. of Physics.
**REDISTRIBUTION OF TRAPPED PROTONS DURING A MAGNETIC STORM,**
by C. E. McIlwain. Apr 64, 30p
Contract NASR-116; Grant NSG-538
NASA CR-60314
Distribution: No limitation.

Descriptors: (*Proton scattering, Magnetic storms), (*Magnetic storms, Proton scattering).

**N65-15404** **Field 4A, 20H, 3B**
**CFSTI Prices: HC$1.00 MF$0.50**
State Univ. of Iowa, Iowa City.
**THE ANOMOLOUS ENERGY SPECTRUM OF PROTONS IN THE EARTH'S RADIATION BELT,**
by R. W. Fillius, and C. E. McIlwain. 1963, 9p
Contracts NAS5-1683, NASR-116
NASA CR-60346
Distribution: No limitation.

Descriptors: (*Protons, Van Allen radiation belt), (*Van Allen radiation belt, Protons).

**N65-15424** **Field 4A, 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
California U., La Jolla. Dept. of Physics.
**THE DRIFT VELOCITY OF TRAPPED PARTICLES,**
by A. Hassitt. 30 Sep 64, 18p
Grant NsG-538
NASA CR-60352
Distribution: No limitation.

Descriptors: (*Van Allen radiation belt, Drift), (*Charged particles, Ionosphere).

**N65-17220** **Field 4A, 8N**
**CFSTI Prices: HC$2.00 MF$0.50**
AVCO-Everett Research Lab., Everett, Mass.
**THE TAIL OF THE MAGNETOSPHERE.**
Research rept., revised ed.,
by W. I. Axford, H. E. Petschek, and G. L. Siscoe. Dec 64, 76p Rept. no. RR-190
Contract NASw837
NASA CR-60745
Distribution: No limitation. Revision of manuscript submitted Aug 64.

Descriptors: (*Terrestrial magnetism, Upper atmosphere), (*Upper atmosphere, Terrestrial magnetism).

**N65-17609** **Field 4A**
**CFSTI Prices: HC$3.00 MF$0.75**
Iowa State Univ., Iowa City.
**THE MORPHOLOGY OF THE OUTER ZONE ELECTRON DISTRIBUTION AT LOW ALTITUDES FROM JANUARY THROUGH JULY AND SEPTEMBER, 1963 FROM INJUN III,**
by T. Armstrong. 1964, 87p SUI-64-40
Contract Nonr150906
AD 611 094
Distribution: No limitation.

Descriptors: (*Upper atmosphere, Electron density).

**N65-21311** **Field 4B, 16B, 22B**
**CFSTI Prices: HC$2.00 MF$0.50**
Army Electronics Research and Development Activity, White Sands Missile Range, N. M.
**AEROBEE NASA 4.63 GS (S/N NASA 133).**
Meteorological data rept.,
by Marjorie McLardie Hoidale. Apr 65, 45p ERDA-295
Task 1V6 50212D127 02
Distribution: No limitation.

Descriptors: (*Sounding rockets, Impact prediction), (*Meteorology, Exterior ballistics).

Identifiers: Aerobee.

**N65-22135** **Field 4B**
**CFSTI Prices: HC$2.00 MF$0.50**
Lockheed-California Co., Burbank.
**STUDY OF HIGH RESOLUTION WIND MEASURING SYSTEMS. PHASE I SURVEY,**
by Fox Conner, W. W. Hildreth, Jr., andLedolph Baer. 16 Oct 64, 49p Rept. on LR-18313
Contract NAS8 11286
NASA CR-62295
Distribution: No limitation.

Descriptors: (*Anemometers, Scientific research).

**N65-23915** **Field 4A, 20A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**ROCKET MEASUREMENTS OF COSMIC NOISE INTENSITIES BELOW 5 Mc/s,**
by J. K. Alexander and R. G. Stone. Apr 65, 26p NASA-TM-X-55216, X-615-65-185
Distribution: No limitation.

Descriptors: (*Noise, Measurement), (*Ionosphere, Noise).

**N65-25004** **Field 4A**
**CFSTI Prices: HC$3.00 MF$0.50**
Iowa State Univ., Iowa City.
**DIURNAL AND LATITUDE EFFECTS OBSERVED FOR 10 KEV ELECTRONS AT LOW SATELLITE ALTITUDES,**
by Theodore A. Fritz and Donald A. Gurnett. Feb 65, 60p Rept. no. 65-3
Contract Nonr150906, Grant NsG233 62
NASA CR-62888
Distribution: No limitation.

Descriptors: (*Electron density, Satellites (Artificial)).

**N65-25400** **Field 4A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, New York. Goddard Inst. for Space Studies.
**CORPUSCULAR STREAMS RELATED TO SOLAR M-REGIONS,**
by Tatsuzo Obayashi. 1964, 30p NASA-TMX-56520
Distribution: No limitation.

Descriptors: (*Solar radiation, Sunspots), (*Ionospheric disturbances, Solar wind).

**N65-29793** **Field 4A**
**CFSTI Prices: HC$2.00 MF$0.50**
GCA Corp., Bedford, Mass.
**CANISTER FOR PRODUCING TMA TRAILS IN THE UPPER ATMOSPHERE,**
by A. Corman and N. J. Guarino. Feb 65, 34p GCA-TR-65-2N
Contract NASw-1083
NASA CR-57751
Distribution: No limitation.

Descriptors: (*Condensation trails, Metalorganic compounds), (*Containers, Metalorganic compounds), (*Aluminum, Alkanes).

N65-33843 Field 4A
CFSTI Prices: HC$2.00 MF$0.50
Goddard Space Flight Center, Greenbelt, Md.
**THERMAL ESCAPE OF NEUTRAL HYDROGEN AND ITS DISTRIBUTION IN THE EARTH'S THERMOSPHERE,**
by Mordehai Liwshitz and S. F. Singer. Sep 65, 29p
NASA TN-D-2992
Prepared in cooperation with Miami Univ. Coral Gables, Fla. Distribution: No limitation.

Descriptors: (*Hydrogen, Atmosphere), (*Atmosphere, Hydrogen).

N65-35063 Field 4A
CFSTI Prices: HC$1.00 MF$0.50
Goddard Space Flight Center. Greenbelt, Md.
**ON THE DETERMINATION OF PRESSURE AND PROFILES FROM TEMPERATURE PROFILES IN THE ATMOSPHERE,**
by J. S. Theon and W. Nordberg. Oct 65, 11p
NASA-TND-3009
istribution: No limitation.

Descriptors: (*Atmosphere, Thermal analysis).

PB-168 363 Field 4B
CFSTI Prices: HC$3.00 MF$0.50
New York Univ., N. Y. Dept. of Meteorology and Oceanography.
**HURRICANES AND THE SEA SURFACE TEMPERATURE FIELD, PART I. THE EXCHANGE OF ENERGY BETWEEN THE SEA AND THE ATMOSPHERE IN RELATION TO HURRICANE BEHAVIOR, PART II.**
National Hurricane Research Project,
by Edwin L. Fisher. Jun 57, 53p
Contract Cwb-8731
NHRP 8
Distribution: No limitation.

Descriptors: (*Tropical cyclones, Thermodynamics), (*Marine meteorology, Tropical cyclones), (*Hurricane tracking, Marine meteorology), Oceans, Surface temperatures, Heat transfer, Energy, Storms, Correlation techniques.

In Part I of this report the behavior of hurricane tracks and the variations of the intensity of hurricanes are investigated in a study of the sea surface temperatures around eleven hurricanes. By the use of several methods of analysis, it is found that there is distinct, although not conclusive, evidence that hurricanes tend to form near relatively warm ocean areas, that they tend to follow tracks along the areas of warmest water, and that they tend to weaken when they move over pronouncedly colder water. The study reported in Part I having suggested a relationship between sea surface temperatures and hurricane behavior, it was felt that the mechanism producing this effect must be the eddy flux of energy from sea to air in the vicinity of a hurricane. In Part II this is investigated synoptically by means of the equations used by Jacobs, and it is concluded that there is some evidence of a relationship. (Author)

PB-168 380 Field 4B
CFSTI Prices: HC$1.00 MF$0.50
Miami Univ., Coral Gables, Fla. Radar Meteorological Section.
**A NOTE ON THE ORIGIN OF HURRICANE RADAR SPIRAL BANDS AND THE ECHOES WHICH FORM THEM,**
by H. V. Senn and H. W. Hiser. Feb 59, 20p
NHRP 26
Distribution: No limitation.

Descriptors: (*Tropical cyclones, Radar scanning), (*Hurricane tracking, Meteorological radar), (*Meteorological radar, Hurricane tracking), (*Radar scanning, Tropical cyclones), Marine meteorology, Air mass analysis, Raindrops, Radar echo areas.

Analysis of the histories of spiral rain bands as observed on radar indicates that they are usually formed near the center of the storm and propagate radially outward. The rainband, therefore, maintains a quasiconservative position relative to the quadrants in which it is formed and does not rotate about the storm center. Furthermore, the radar echoes are not simply preexisting elements which assume the spiral shape but appear to have their origin in the outward propagated band. Data from several hurricanes are used to illustrate this hypothesis. Evidence is also presented which indicates that the eye of the hurricane is defined by a wall cloud made up of one or more spiral band fragments in the process of generation.

PB-168 388 Field 4B
CFSTI Prices: HC$1.00 MF$0.50
Chicago Univ., Ill.
**UNREST IN THE UPPER STRATOSPHERE OVER THE CARIBBEAN SEA DURING JANUARY 1960,**
by Herbert Riehl and Ralph Higgs. Apr 60, 13p
NHRP 37
Prepared in cooperation with U. S. Weather Bureau, San Juan, P. R. Distribution: No limitation.

Descriptors: (*Marine meteorology, Caribbean Sea), Stratosphere, Wind, Atmospheric motion, Tropical regions.

Wind obserservations were taken at a network of stations around the Caribbean from 100,000 to 120,000 feet altitude in January 1960. After an initial period of strong but variable esterly winds a large disturbance emanated from the equatorial zone with structure similar to what is observed in the low troposphere during the hurricane season. The history of this equatorial shearline is described. (Author)

PB-168 590 Field 4B
CFSTI Prices: HC$2.00 MF$0.50
Weather Bureau, Washington, D. C. Techniques Development Lab.
**OBJECTIVE PREDICTION OF DAILY SURFACE TEMPERATURE.**
Technical note,
by William H. Klein, Curtis W. Crockett andCarlos R. Dunn. Sep 65, 49p WB-TN-10-TDL-1
Distribution: No limitation.

Descriptors: (*Surface temperatures, Weather forecasting), (*Weather forecasting, Urban areas), Climatology, Meteorological parameters, Meteorological charts, Mathematical models, Programming (Computers).

An objective method of forecasting surface temperature at 39 cities in the United States for 1, 2, and 3 days in advance has been developed and tested under operational conditions. This method utilizes daily input to multiple regression equations derived previously for predicting 5-day mean temperature from fields of 700-mb. height and surface temperature. Comparative verification shows that the objective forecasts have skill generally higher than chance, climatology, and persistence. In fact, these exploratory regression equations produce forecasts which approximate the skill of subjective predictions made by experienced meteorologists. Recent experiments are described which indicate that improved forecasts result when 700-1000-mb. thickness is included as a predictor. Therefore, a new set of equations for maximum and minimum temperatures is being derived for 108 cities from 16 years of daily values of surface temperature, thickness, and 700-mb. height. (Author)

PB-168 604 Field 4B
CFSTI Prices: HC$4.00 MF$0.75
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
**EFFECT OF LARGE MOUNTAIN RANGES ON ATMOSPHERIC FLOW PATTERNS AS SEEN FROM TIROS SATELLITES.**
Final rept. 15 Jun 64-31 Aug 65,
by E. R. Reiter, D. W. Beran, J. D. Mahlman andG. Wooldridge. Sep 65, 113p ASTP-69
Contract Cwb-10879,
Proj. WISP
Distribution: No limitation.

Descriptors: (*Mountains, Wind), (*Wind, Mountains), (*Meteorological satellites, Air mass analysis), Fluid mechanics, Orogeny, Atmospheric motion, Flow visualization, Cloud cover, Aerial photographs, Photographic analysis.

Identifiers: TIROS.

A survey is given of case studies of TIROS cloud patterns conducted under the provisions of the present research contract with the U. S. Weather Bureau. Detailed investigations were made, or are in progress, of a chinook period in the Colorado region; of a macro- and mesoscale wave-cloud pattern over North Platte; of a baroclinic wave formation along a cold front east of the Rocky Mountains; of the association of an observed cloud band with the jet stream; of the flow pattern around a cyclone over Minnesota; and of the flow in two merging jet streams. This report contains only a summary of results. More details will be given in forthcoming project reports. (Author)

PB-168 608 Field 4B
CFSTI Prices: HC$1.00 MF$0.50
Weather Bureau, Washington, D. C. Techniques Development Lab.
**HURRICANE CINDY GALVESTON BAY TIDES.**
Technical note,
by N. A. Pore, A. T. Angelo and J. G. Taylor. Sep 65, 10p WBTN-11-TDL-2
Distribution: No limitation.

Descriptors: (*Tropical cyclones, Tides), (*Tides, Tropical cyclones), (*Marine meteorology, Tropical cyclones), Mexico Gulf, Hurricane tracking, Meteorological parameters, Oceanographic data, Seacoast, Texas, Hydrology.

Identifiers: Hurricane Cindy (1963).

Hurricane Cindy of September 1963 probably produced the most completely recorded set of tide data in a bay of any United States hurricane. Hydrographs showing the water levels in Galveston Bay along with pertinent meteorological data are presented. (Author)

PB-168 689 Field 4B
CFSTI Prices: HC$4.00 MF$1.00
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
**ON THE SCALES OF MOTION AND INTERNAL STRESS CHARACTERISTICS OF THE HURRICANE.**
Technical note,
by William M. Gray. Oct 65, 128p
WB TN-14-NHRL-73
Distribution: No limitation.

Descriptors: (*Hurricane tracking, Air mass analysis), (*Tropical cyclones, Convection (Atmospheric)), (*Marine meteorology, Tropical cyclones), (*Atmospheric motion, Tropical cyclones), Equations of motion, Fluid mechanics, Thermodynamics, Storms.

This study presents observational evidence of the correlation of horizontal and vertical wind components within the deep cumulus convection of the hurricane-- with its associated stress, frictional acceleration, and kinetic energy dissipation and generation. It is implied that grid intervals of smaller size than the typical convective cell must be employed in order to incorporate these features realistically. General parameterization of the effects of the convective elements appears very difficult or impossible because of the apparent uncorrelated nature of the convective element with the mean motion. This complicates any synoptic or meso-scale treatment of the convective atmos-

phere. The intent of this paper is to demonstrate observationally the nature of this complexity. Investigation is made of the wind and pressure-height data obtained during the 1958 season by the National Hurricane Research Project B-50 aircraft from 28 radial penetrations in hurricanes at levels between 830 and 560 mb. Horizontal wind velocities are measured by an AN/APN-82 radio navigation instrument based on the Doppler shift. This measurement, together with the author's previous calculation of vertical air velocity along these same radial legs gives the complete three-dimensional cylindrical wind representation. The strongest vertical motion is concentrated in areas with characteristic widths of 2 to 4 km. The horizontal winds show fluctuations with characteristic widths ranging from 6 to 18 km. (Author)

**PB-168 763** **Field 4A**
**CFSTI Prices: HC$3.00 MF$0.75**
Douglas Aircraft Co., Inc., Santa Monica, Calif. Missile and Space Systems Div.
**THE AIRBORNE MEASUREMENT OF MICROWAVE EMISSION FROM THE EARTH'S SURFACE AND ATMOSPHERE.**
Final rept.
Sep 65, 90p
Contract Cwb-10932
Distribution: No limitation.

Descriptors: (*Microwaves, Emissivity), (*Emissivity, Terrain), (*Atmospheric sounding, Microwaves), Surface properties, Electromagnetic fields, Radiometers, Airborne.

The interdependence was studied of the measured microwave emissions on (1) the vertical distribution of microwave emission and absorption in the atmosphere, (2) the microwave emission from different surfaces, and (3) the vertical structure of the atmosphere. The study was directed toward the application of passive microwave observations for sounding the atmosphere and identifying terrain types from orbiting satellites. The theory is discussed of radiative transfer in the microwave region with emphasis on the two wavelengths, 1.35 cm (22.235 GHz, or Gc/sec) and 1.90 cm (15.78 GHz). The 1.35 cm wavelength corresponds to the center of the water vapor resonance line and the surface emissions are modified by intervening water vapor in the atmosphere. The 1.90 cm wavelength is located on the line wing and acts as a 'window.'

## 5. BEHAVIORAL AND SOCIAL SCIENCES

**AD-413 102** **Field 5K**
**CFSTI Prices: HC$1.00**
RAND Corp., Santa Monica, Calif.
**ARE CITIES HERE TO STAY,**
by Edward F. R. Hearle. Jul 63, 15p P-2764
Distribution: No limitation.

Descriptors: (*Urban areas, Analysis), Population, Employment, Communication systems, Data processing systems, Transportation, Traffic, Economics, Political science, Sociology.

The growth of cities is examined in three dimensions: the changes in cities since World War II, the causes that have brought these changes about, and the forecasts we can make concerning the character of cities a decade or two hence.

**AD-442 707** **Field 5I**
**CFSTI Price: HC$2.00**
Armed Forces-NRC Committee on Vision, Washington, D. C.
**VISUAL REQUIREMENTS FOR FLYING: SOME ASPECTS OF RE-EVALUATION,**
by Arthur Jampolsky and Ailene Morris. Jun 54, 30p
Contract Nonr-2300 (05)
N64 29650
Distribution: No limitation.

Descriptors: (*Pilots, Physical fitness), (*Vision, Pilots), Selection, Standards.

Identifiers: Personnel screening tests.

**AD-449 484** **Field 5E, 6J, 14B**
**CFSTI Prices: HC$1.00**
Human Engineering Labs., Aberdeen Proving Ground, Md.
**A SURVEY OF INSTRUMENTATION FOR PRODUCING IMPULSE NOISE.**
Technical note,
by David C. Hodge and Robert B. Soderholm.
Mar 64, 13p TN-3-64
Distribution: No limitation.

Descriptors: (*Noise generators, Sources), (*Human engineering, Noise), Auditory perception, Guns, Army personnel, Stress (Physiology), Hearing, Thresholds (Physiology).

The need for a source of impulse noise providing independent control, within specified limits, of peak sound-pressure level, rise time, and duration is discussed. A survey of impulse-noise sources that have been used in past studies is presented. (Author)

**AD-450 472** **Field 5J**
**CFSTI Price: HC$2.00**
Aeromedical Research Lab. (6571st), Holloman AFB, N. Mex.
**REACTION TIME OF THE PRE-ADOLESCENT CHIMPANZEE (UNDER CONDITIONS OF NEGATIVE REINFORCEMENT).**
Interim rept. 962-1963,
by Herbert H. Reynolds, Donald L. Hay and Vernon Pegram. Sep 64, 28p ARL-TR-64-10
Proj. AF-6893,
Task 689302
N65 10466
Distribution: No limitation.

Descriptors: (*Behavior, Chimpanzees), (*Reaction (Psychology), Chimpanzees), Conditioned reflex, Performance tests, Stimulation, Reflexes, Time studies.

An 'allowable interval' for responding has been arbitrarily used in animal reaction time studies, having no empirical basis in systematic investigations of an animal's optimal response capability. The comparative psychology research program of this laboratory has made great use of such a procedure, employing the preadolescent chimpanzee as a surrogate for man in potentially high risk situations. However, it was felt that a need existed to know more about the optimal discrete response characteristics of the chimpanzee, with regard to both single and multiple stimuli. The results of this research, in which negative reinforcement (low amperage shock) was used, indicate that the reaction time of the preadolescent chimpanzee in an experimental situation approximating that of routine laboratory performance testing is highly similar to that of man. In programming tasks, which involve single or multiple stimuli to which a discrete response must be made, suggestions are made concerning the allowable time interval for responding. (Author)

**AD-465 850** **Field 5I**
**CFSTI Prices: HC$2.00 MF$0.50**
Naval Personnel Research Activity, San Diego, Calif.
**A METHOD FOR DEVELOPING OPTIMAL PETTY OFFICER RATIOS,**
by R. D. Conner and R. V. May, Jr. May 65, 29p Research rept. SRR-65-3
Task 3.1602.11.01.S1
Distribution: No limitation.

Descriptors: (*Naval personnel, Manpower studies), (*Officer personnel, Selection), Mathematical models, Military requirements, Personnel management.

The report describes the application of a computerized mathematical model which simulates enlisted manpower changes at pay grades of naval enlisted ratings in the determination of optimal petty officer ratios. Use of the model to predict percentage of requirements met in future years is demonstrated, using current values of the significant variables of retention, advancement, requirements, and non-petty officer base. The model is also used to determine the changes in these variables necessary to meet requirements under three non-petty officer bases. (Author)

**AD-465 851** **Field 5I**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval Personnel Research Activity, San Diego, Calif.
**METHOD DEVELOPMENT FOR BASIC TECHNICAL SKILLS RESEARCH, A PROGRESS REPORT,**
by Joe Silverman and Malcolm J. Carr. May 65, 25p Research rept. SRR-65-4
Task 3.1605.03.01.S1
Distribution: No limitation.

Descriptors: (*Naval personnel, Manpower studies), Selection, Job analysis, Human engineering, Military requirements, Management planning, Personnel management, Data processing systems, Programming (Computers).

Research is being conducted to develop a method for determining technical skills required for current and future weapons and support systems. It is to serve as a basis for the Navy enlisted personnel classification structure required in the next decade. The application of a multi-dimensional approach to occupational analysis was explored. This method involves the analysis of task patterns in terms of the Technical, Organizational, and Communicational dimensions of the work situation. The acronym SAMOA (Systematic Approach to Multidimensional Occupational Analysis) has been adopted as a label for this method. An iterative computer clustering program was devised to group similar task patterns into homogeneous occupational segments. A method of determining skill levels with high reliability was developed to classify tasks into a hierarchy of difficulty and complexity. (Author)

**AD-466 192** **Field 5I**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval Personnel Research Activity, San Diego, Calif.
**SUITABILITY OF A SIMPLE TASK FOR THE STUDY OF TEAM TRAINING PROBLEMS.**
Final rept.,
by William H. Payne and Daniel N. Braunstein.
Jun 65, 15p Research Memo. SRM-65-5
Task 01703.02.08
Distribution: No limitation.

Descriptors: (*Naval training, Performance tests), Visual signals, Signals, Detection, Training, Signalto-noise ratio, Programming (Computers), Group dynamics, Performance (Human), Naval personnel, Visual perception.

Four teams of four subjects were given a signal detection task under three organizing conditions. Stimulus materials were rigidly controlled, and order of conditions was counterbalanced. No significant differences were found in number of signals detected. Experiments using similarly controlled stimulus materials, but involving more complex tasks and organizing conditions are suggested in order to study the effect of team organizing conditions on performance. (Author)

**AD-466 272** **Field 5I, 8F**
**CFSTI Price: HC$4.00**
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
**ENVIRONMENTAL DESCRIPTIONS OF RANGER TRAINING AREAS. PART 2. EGLIN FIELD AREA, FLORIDA.**
31 Aug 64, 139p
Contract DA-22-079-eng-333,
Proj. DA-1-T-0-21701-A-131
Distribution: No limitation.

Descriptors: (*Terrain, Military facilities), (*Military training, Guerrilla warfare), (*Florida, Military facilities), Armed forces (United

States), Maps, Geology, Soils, Penetration, Hydrology, Geometry, Plants (Botany), Sampling, Islands.

The Ranger training area at Eglin Field, Florida, is described in the present report. Macrogeometric and vegetational data compiled in the study are plotted on areal maps on a scale of 1:50,000. (Author)

**AD-466 273** **Field 5I, 8F**
**CFSTI Price: HC$4.00**
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
**ENVIRONMENTAL DESCRIPTIONS OF RANGER TRAINING AREAS. PART 3. FORT BENNING AREA, GEORGIA.**
31 Aug 64, 148p
Contract DA-22-079-eng-333,
Proj. DA-1-T-0-21701-A-131
Distribution: No limitation.

Descriptors: (*Terrain, Military facilities), (*Military training, Guerrilla warfare), (*Georgia, Military facilities), Geology, Geography, Soils, Plants (Botany), Forestry, Trees, Maps, Sand, Hydrology, Visibility, Ecology, Area coverage, Civil engineering.

This study, a part of the U. S. Army Research and Development Board Project MEGA, has been concerned with three U. S. Army Ranger training areas located in north Georgia, Eglin Field, Florida, and Fort Benning, Georgia. Reports designated Part 1 and Part 2, dealing with the north Georgia and Florida areas, respectively, have been previously submitted. The third and concluding report on the investigation contained in the following pages consists of the results obtained in the Fort Benning phase of the study followed by some summary comments regarding the whole study. Area maps accompanying the report represent the compilation of macrogeometric and vegetational data from the Fort Benning area drawn to a scale of 1:20,000. (Author)

**AD-466 274** **Field 5I, 8F, 6C**
**CFSTI Price: HC$3.00**
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
**VEGETATION DIAGRAMS; RANGER TRAINING AREA, FT. BENNING, GEORGIA.**
1 Aug 64, 64p
Contract DA-22-079-eng-333,
Proj. DA-1-T-0-21701-A-131
Distribution: No limitation.

Descriptors: (*Terrain, Military facilities), (*Military training, Guerrilla warfare), (*Georgia, Military facilities), Area coverage, Distribution, Structure, Ecology, Graphics, Maps, Trees.

**AD-466 275** **Field 5I, 8F, 6C**
**CFSTI Price: HC$3.00**
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
**VEGETATION DIAGRAMS; RANGER TRAINING AREA, EGLIN AIR FORCE BASE, FLORIDA.**
1 Aug 64, 100p
Contract DA-22-079-eng-333,
Proj. DA-1-T-0-21701-A-131
Distribution: No limitation.

Descriptors: (*Terrain, Military facilities), (*Military training, Guerrilla warfare), (*Florida, Military facilities), (*Plants (Botany), Terrain), Analysis, Georgia, Army research, Trees, Ecology, Graphics, Maps.

**L1.42/2:965** **Field 5I**
**CFSTI Price: MF$1.50**
Department of Labor, Washington, D. C.
**MANPOWER REPORT OF THE PRESIDENT AND A REPORT ON MANPOWER REQUIREMENTS, RESOURCES, UTILIZATION, AND TRAINING.**
Mar 65, 294p
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $1.75.

Descriptors: (*Manpower studies, United States), Employment, Labor, Standards, Wages, Training, Education, Economics, United States Government, Statistical data, Tables.

Contents: Review of current development; Manpower resources and requirements; Manpower development; Matching workers and jobs; Recent research on practices affecting mobility; Statistics.

**N65-16816** **Field 5J**
**CFSTI Prices: HC$2.00 MF$0.50**
Office of Naval Research, Washington, D. C.
**STUDIES OF AUDITORY INFORMATION PROCESSING EMPHASIZING THE APPLICATION OF SIGNAL DETECTABILITY THEORY TO THE AUDITORY SENSORY RESPONSES,**
Quarterly progress rept. no. 2, 1 Sep-30 Nov 64,
by L. A. Jeffress. 13 Jan 65, 37p
Contract NASA Order R-129, NONR-3579/04
NASA CR-60441
Distribution: No limitation.

Descriptors: (*Auditory perception, Signals), (*Auditory signals, Perception (Psychology)).

**N65-17603** **Field 5E**
**CFSTI Prices: HC$4.00 MF$1.00**
Garrett Corp., Phoenix, Ariz. Airesearch Mfg. Div.
**HUMAN FACTORS AND ENVIRONMENTAL CONTROL/ LIFE SUPPORT SYSTEMS STUDY PROGRAM. LUNAR EXPLORATION SYSTEMS FOR APOLLO.**
Midterm status rept.
16 Dec 64, 142p Rept. no. SS-3242
Contract NAS8-11447
NASA CR-60909
Distribution: No limitation.

Descriptors: (*Human engineering, Life support), (*Life support, Space environmental conditions).

**N65-21479** **Field 5J**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**INTER-SENSORY JUDGMENTS OF SIGNAL DURATION,**
by Trieve A. Tanner, Jr., R. Mark Patton, and R. C. Atkinson. 1964, 11p NASA-TM-X-51729
Distribution: No limitation. Presented at the Aerospace Medical Association Meeting, Miami, Fla., 11-14 May 64.

Descriptors: (*Visual signals, Perception (Psychology)), (*Auditory signals, Perception (Psychology)), (*Sensory perception, Signals).

**N65-21766** **Field 5H**
**CFSTI Prices: HC$2.00 MF$0.50**
Bolt Beranek and Newman, Inc. Cambridge, Mass.
**STUDIES OF MANUAL CONTROL SYSTEMS.**
Progress rept. no. 6, 19 Oct 64-18 Jan 65.
19 Mar 65, 37p Job no. 11126
Contract NAS2668
NASA CR-62251
Distribution: No limitation.

Descriptors: (*Man-machine systems, Tracking), (*Tracking, Man-machine systems).

**N65-26415** **Field 5B**
**CFSTI Prices: HC$2.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge.
**THE UTILIZATION OF INFORMATION SOURCES DURING R and D PROPOSAL PREPARATION,**
by Thomas J. Allen. Oct 64, 34p MIT-R-97-64
Grant NSF-GN-233
NASA CR-63407
Distribution: No limitation.

Descriptors: (*Technical information centers, Sources), (*Research program administration, Effectiveness).

**N65-32961** **Field 5B**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**A CENTRAL FACILITY FOR RECORDING AND PROCESSING TRANSIENT-TYPE DATA,**
by Richard L. Smith. Jan 63, 82p
NASA TND-1320
Distribution: No limitation.

Descriptors: (*Data processing systems, Oscilloscopes).

**N65-34500** **Field 5J**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Ctr.
**RANGE ESTIMATION OF FAMILIAR TARGETS PRESENTED AGAINST A BLACK BACKGROUND,**
by Gary P. Beasley and Jack E. Pennington. Oct 65, 25p
NASA TND-2845
Distribution: No limitation.

Descriptors: (*Targets, Visual perception), (*Visual perception, Targets).

**PB-168 592** **Field 5D**
**CFSTI Prices: HC$4.00 MF$1.00**
Arms Control and Disarmament Agency, Washington, D. C.
**REPORT ON THE DEBATE IN THE UNITED NATIONS DISARMAMENT COMMISSION, APRIL 21-JUNE 16, 1965.**
Research rept.,
by James S. Bodnar. Sep 65, 134p RR-65-3
Distribution: No limitation.

Descriptors: (*Disarmament, United Nations), (*United Nations, Disarmament), USSR, United States Government, Nuclear explosions, Tests, Nuclear weapons, Military personnel, Military facilities.

Contents: The general debate (April 26-May 25, 1965): Openning statements by the Soviet Union and United States; developing debate and consensus. The debate on draft resolutions: Soviet draft resolutions on the withdrawal of troops and dismantling of bases (DC/218) and the prohibition of the use of nuclear weapons (DC/219); US draft resolution (DC/220); Yugoslav draft resolution on a world disarmament conference (DC/221) and amendments proposed by Malta (DC/223); Submission of 24-power omnibus draft resolution (DC/222). The adoption of resolutions: Question of priorities; Voting on resolutions (DC/221 and DC/222) and disposition of Soviet and US draft resolutions.

**PB-168 593** **Field 5B, 9B**
**CFSTI Prices: HC$6.00 MF$1.25**
Biological Sciences Communication Project, American Inst. of Biological Sciences, Washington, D.C.
**INFORMATION HANDLING AND SCIENCE INFORMATION. A SELECTED BIBLIOGRAPHY, 1957-1961,**
by Paul C. Janaske. 1962, 245p
Grant NSF-G14643
Part 2 of rept. on seminar on Biological Science Communication, Washington, D. C., 19-30 Jun 61, sponsored jointly with American Univ., Washington, D. C., Center for Technology and Administration. Distribution: No limitation.

Descriptors: (*Documentation, Bibliographies), (*Information retrieval, Bibliographies), Scientific research, Abstracts.

The major emphasis in making the selection of items is handling of scientific information and the application of mechanical systems of information storage and retrieval. In addition to this, related areas of interest such as scientists' use of literature, guides to the use of scientific literature, mechanical translation, training of information specialists, reprography, subject classification, and indexing have been included. The arrangement of the bibliographic entries is alphabetical by author. When an individual has not been indicated as the author, the entry is included as a corporate body and in the absence of either of these, the item has been entered by title in its alphabetical sequence. Each item has been numbered for indexing purposes.

**PB-168 596** **Field 5J, 6E**
**CFSTI Prices: HC$1.00 MF$0.50**
William Alanson White Inxst., New York.
**COMPUTER ANALYSIS OF VERBAL BEHAVIOR IN PSYCHIATRIC INTERVIEWS,**
by Joseph Jaffe. Dec 62, 24p
Grants PHS-M-4571, PHS-M-4548
Prepared for presentation at Association for Research in Nervous and Mental Disease, N. Y. C., Dec 62. Distribution: No limitation.

Descriptors: (*Psychiatry, Data processing systems), (*Verbal behavior, Psychiatry), Digital computers, Programming (Computers), Behavior, Vocabulary, Word association, Graphics.

The paper describes specific techniques for interview analysis with the aid of digital computers. It demonstrates that certain easily computable indices of verbal behavior take on additional meaning when examined in the context of two-person, or dyadic communication systems. A suggestion is made that overt characteristics of the message exchange may identify clinically important transitions in a sequence of interviews.

**PB-168 605** **Field 5C**
**CFSTI Prices: HC$2.00 MF$0.50**
Princeton Univ., N. J. Econometric Research Program.
**ANOTHER VIEW OF THE LONG SWING: COMMENTS ON ADELMAN'S STUDY OF LONG CYCLES.**
Research memo.,
by Michio Hatanaka and E. Philip Howrey. Jul 65, 29p RM-77
Grants NSF-GS-551, NSF-GP-579
Distribution: No limitation. Prepared in cooperation with Rochester Univ., N. Y.

Descriptors: (*Economics, United States), Time, Test methods, History, Analysis.

Identifiers: Gross National Project, Prediction.

Prof. Irma Adelman's recent study, 'Long Cycles Fact or Artifact,' ('American Economic Review,' June 1965, p. 444-463), represents an attempt to apply spectral analysis to time series data in order to ascertain the relative contribution of a long-swing component to the historical time path of economic activity in the United States. This paper has been prepared in an attempt to point out some of the subleties involved in the application of spectral analysis and to suggest that Adelman's rejection of the long-swing hypothesis is not well-founded. Although the paper is concerned primarily with the long-swing hypothesis, the comments on hypothesis testing and filtering techniques are applicable to a wider class of problems and illustrate the flexibility of the estimation technique. The basic conclusion which emerges is that the estimates presented by Adelman contain virtually no information about the long swing. In an attempt to rectify this deficiency, two alternative estimation procedures are introduced. The alternative estimates which are obtained suggest that the case for the long-swing hypothesis is mixed; some of the evidence examined being favorable and some unfavorable. Without further analysis it is impossible to formulate a definite conclusion about the existence of long cycles in the historical pattern of development of the United States economy. (Author)

**PB-168 614** **Field 5B, 6E**
**CFSTI Prices: HC$1.00 MF$0.50**
Yale Univ., New Haven, Conn. Medical Library.
**COMPUTER APPLICATIONS IN BIOMEDICAL LIBRARIES,**
by Frederick G. Kilgour. 1965, 8p
Partially supported by National Science Foundation, Washington, D. C. Presented at IBM Scientific Computing Symposium on Man-Machine Communication, 3-5 May 65. Distribution: No limitation.

Descriptors: (*Computers, Libraries), (*Libraries, Medicine), (*Information retrieval, Medicine), Indexes, Bibliographies, Periodicals, Punched cards, Programming (Computers).

**PB-168 668** **Field 5I, 19E, 17E**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**INFRARED TARGET SIMULATOR MODEL NO. 486901-100, TYPE NO. AN/AAM-5 (HUGHES).**
Technical manual test equipment calibration procedures, QAB-1.
15 Oct 65, 18p NAVWEPS-17-20QAB-1
Distribution: No limitation.

Descriptors: (*Targets, Simulators), (*Simulators, Infrared equipment), (*Infrared equipment, Calibration), Instruction manuals, Test methods.

The manual contains instructions for calibration of the IR Target Simulator AN/AAM-5. The Test Instrument will be calibrated after servicing, every six months, or whenever it shows evidence of incorrect operation resulting in improper levels of infrared energy being emitted.

**PB-168 683** **Field 5B**
**CFSTI Prices: HC$1.00 MF$0.50**
Herner and Co., Washington, D. C.
**DEEP SUBJECT INDEXING BY MANUAL PERMUTATION METHODS.**
Revised ed.,
by Saul Herner. 17 Oct 63, 11p
Contract AF49 (638)-1182
Pub. in Proceedings of the ADI Annual Meeting, 1963, p435-7 pt3 Oct 1963. Distribution: No limitation.

Descriptors: (*Indexes, Preparation), (*Subject indexing, Indexes).

Identifiers: Permutation index, KWIC index.

The PERMUTEXT form of permutation indexing was developed whereby phrases descriptive of texts of a document rather than merely titles were indexed. PERMUTEXT was developed as an adjunct to a project in which the primary goal or publication was the publication 'Basic Research Resumes', an indexed compilation of descriptions of basic research projects sponsored by the Air Force Office of Aerospace Research. As an example of this type of indexing, the phrase 'potential on satellite vehicles' would have the following two entries of two lines each, the second line of each entry being denoted by parentheses: potential (on satellite vehicles) and satellite vehicles (potential on). Three rules followed in the permutation were: (1) use the connectives 'of', 'in', 'for', 'on', and 'in study of' where necessary and immediately below the substantive term; (2) avoid the connectives 'by', 'with', 'using', and 'to' wherever possible; and (3) limit the descriptive phrases that are permitted to three permutable terms, wherever possible.

**PB-168 686** **Field 5B**
**CFSTI Prices: HC$3.00 MF$0.75**
American Inst. of Physics, New York. Documentation Research Project.
**EVALUATION OF THE IMPACT OF A CITATION INDEX IN PHYSICS,**
by Ben-Ami Lipetz. 1 Sep 64, 80p AIP/DRP-CI-3 (1964)
See also PB-158 331. Distribution: No limitation.

Descriptors: (*Indexes, Preparation), Physics, Periodicals, Punched cards, Libraries.

Identifiers: Citation index, Evaluation, User surveys.

An experiment was conducted for the purpose of evaluating the impact of a citation index to physics literature upon the literature-use habits of physicists. A citation index was specially prepared in which it is possible to look up a known reference in either 'The Physical Review' or the 'Journal of Applied Physics' to learn whether, and precisely where, it was cited in four of the leading Soviet physics journals which are published in English translation by the American Institute of Physics. It was hypothesized that the index would help United States physicists to learn of Soviet articles with subject contents similar to the known articles they would start with, and would therefore tend to increase their utilization of the physics translation journals. Results obtained from the various measurement and evaluation techniques used in the experiment are in good agreement. It is concluded that the citation index technique in its present state of development can be applied with highly beneficial results to some of the literature search problems of physicists.

**PB-168 755** **Field 5H, 5E, 5J**
**CFSTI Prices: HC$3.00 MF$0.75**
Applied Psychology Corp., Arlington, Va.
**DESIGN STANDARDS FOR MAN-MACHINE TASKS IN SIGNAL CORPS SYSTEMS.**
Quarterly progress rept. no. 3, 1 Dec 59-1 Mar 60,
by Kenneth G. Cook and Donald H. Armsby. 1 Mar 60, 56p
Contract DA-36-039-sc-78328,
Proj. DA-3-99-00-110
AD 235 779
Distribution: No limitation.

Descriptors: (*Man-machine systems, Human engineering), (*Human engineering, Man-machine systems), Applied psychology, Systems engineering, Training films, Instruction manuals, Job analysis, Data processing systems, Communication equipment, Design, Military personnel.

Films, equipments and technical manuals were analyzed in terms of the applicability of the Systems Demand Analysis. A sample of design engineers was surveyed to determine structure and the cirtical time in design for a designer aid. Consideration of these findings led to some modifications of proposed methodology. (Author)

**PB-168 757** **Field 5G**
**CFSTI Prices: HC$2.00 MF$0.50**
Linguistics Research Center, Univ. of Texas, Austin.
**AUTOMATIC LINGUISTIC CLASSIFICATION,**
by Eugene D. Pendergraft and Nell Dale. Nov 65, 46p LRC-65-WAT-1
Contract DA-36-039-AMC-02162 (E); Grant NSF-GN-308
Distribution: No limitation.

Descriptors: (*Linguistics, Classification), (*English language, Classification), Automatic, Syntax, Computational linguistics.

Identifiers: Self-organizing systems, Clumps (Documentation), Morphology.

The work plan of a long-range series of experiments in automatic linguistic classification is described, together with discussion of a first experiment. The latter is concerned with category identification. In particular, the data resulting from automatic syntactic analysis of English were used to identify syntactical categories which have similar membership. The series of experiments will combine the use of automatic linguistic analysis and automatic classification techniques. Automatic syntactic analysis, and in later experiments demantic analysis, will be performed within the Linguist-

ics Research System (LRS). Automatic classification will be carried out within the Automatic Classification System (ACS). A programming interface is being constructed between the two systems so that their combined capabilities can be used for automatic linguistic classification and partial self-organization.

**PB-168 758** **Field 5G**
**CFSTI Prices: HC$2.00 MF$0.50**
Linguistics Research Center, Univ. of Texas, Austin.
**ENGLISH DICTIONARY CLASSIFICATION,**
by Tuie Git Lee. Aug 65, 29p LRC-65-WD-1
Grant NSF-GN-308
See also PB-166 656. Distribution: No limitation.

Descriptors: (*English language, Classification), Computational linguistics, Semantics, Syntax, Machine translation, Dictionaries.

Identifiers: Adjectives, Nouns, Verbs.

The paper contains a description of the classification of English adjectives, nouns and verbs in the Linguistics Research System. Paradigms have been devised in chart form defining certain characteristics peculiar to subclasses to parts of speech for adjectives, nouns and verbs. Concise explanations of each subclass with examples are also given. All subclasses are ordered with the most frequently used subclasses listed first.

**PB-168 760** **Field 5B**
**CFSTI Prices: HC$3.00 MF$0.75**
Lehigh Univ., Bethlehem, Pa. Center for the Information Sciences.
**LIBRARY SYSTEMS ANALYSIS. REPORT NO. 3. MANUAL FOR THE ANALYSIS OF LIBRARY SYSTEMS,**
by Robert S. Taylor and Caroline E. Hieber. 8 Sep 65, 84p
Contract OE-5-10-235,
Proj. OE-S-235
Distribution: No limitation.

Descriptors: (*Libraries, Data processing systems), Automation, Documentation, Information retrieval, Programming (Computers), Punched cards, Handbooks.

The manual provides a frame of reference for librarians in analyzing their systems for eventual automation. The automation of library processes will allow the library to expand its participation in the educational functions of the institution in a number of ways. First, it will release valuable professional time from routine operations. Secondly, in the process of defining and writing computer programs for routines, the library profession will be forced to explore the intricacies and redundancies of library systems as they have never been examined before. Thirdly, automation will in the next decade open up entirely new areas of interaction between student and recorded knowledge. The two decks of punched cards described in this manual - one concerning library processes and the other concerning the user and his requirements- should provide an empirically-derived model of a library. The total system or its component parts may be studied from any one or more of many different angles, and the information derived measured against whatever standards the library regards as ideal.

**PB-168 762** **Field 5H, 9B**
**CFSTI Prices: HC$3.00 MF$0.50**
Applied Psychology Corp., Arlington, Va.
**DESIGN STANDARDS FOR MAN-MACHINE TASKS IN SIGNAL CORPS SYSTEMS.**
Quarterly progress rept. no. 2, 1 Sep-1 Dec 59. 1 Dec 59, 58p
Contract DA-36-039-sc-78328,
Proj. DA 3-99-00-110
AD 231 327
Distribution: No limitation. See also AD-227 966.

Descriptors: (*Bionics, Standards), (*Man-machine systems, Design), Information theory, Communication systems.

The report is concerned with the development of a method whereby the human functions in man-machine systems can be classified and analyzed. The emphasis is upon the human functions in non-routine tasks in complex man-machine systems. In order to develop a methodology and to place the human functions within a meaningful framework, it was necessary to assemble and present several theoretical concepts. These are concepts primarily concerning symbolic functioning and information theory. The concepts have a direct bearing on the purposes of the study and lead to concrete applications. The methodology is based upon a number of assumptions. The major assumption is that for any given task there is a particular pattern of demands that the system imposes upon the operator and which must be satisfied by the operator for the successful fulfillment of his mission. A demand may be many things, such as: the resolution of the display, the duration of the message, the nature of the message received, etc. Other assumptions and the application of this functions analysis are discussed. (Author)

# 6. BIOLOGICAL AND MEDICAL SCIENCES

**ACRH-103** **Field 6E, 18B**
**CFSTI Prices: HC$5.00 MF$1.00**
Argonne Cancer Research Hospital, Chicago, Ill.
**MEETING OF THE ADVISORY COMMITTEE TO THE ARGONNE CANCER RESEARCH HOSPITAL PROGRAM, MARCH 4-5, 1965,**
ed. by Leon O. Jacobson. 1965, 170p CONF-650315
Contract AT (11-1)-69
Distribution: No limitation.

Descriptors: (*Cancer, Radiotherapy), (*Radiotherapy, Cancer).

**AD-458 244** **Field 6S**
**CFSTI Price: HC$2.00**
National Academy of Sciences-National Research Council, Washington, D. C. Committee on Hearing, Bioacoustics and Biomechanics.
**HAZARDOUS EXPOSURE TO INTERMITTENT AND STEADY-STATE NOISE,**
by Karl D. Kryter. Jan 65, 37p
Contract Nonr-2300 (05)
Distribution: No limitation.

Descriptors: (*Noise, Hazards), Pressure, Military personnel, Civilian personnel.

This report specifies damage risk criteria for exposure to sound, and contains graphs of maximum sound pressure levels and durations of exposures that are considered tolerable along with examples of the use of these graphs. Also included is background information and a discussion of the rationale, assumptions, limitations, and general problems pertinent to the development and application of damage risk criteria and the related exposure contours. This report is intended primarily for technical persons working in this problem area in the military services and other government agencies. No attempt is made to interpret or simplify the report or procedures contained herein for special or particular operational situations. (Author)

**AD-462 160** **Field 6S**
**CFSTI Price: HC$1.00**
Arctic Aeromedical Lab., Fort Wainwright, Alaska.
**COMPOSITION OF GAINS DURING PROTEIN REPLETION IN THE COLD,**
by David A. Vaughan and Lucile N. Vaughan. Dec 64, 14p AAL-TDR-64-15
Distribution: No limitation.

Descriptors: (*Diet, Cold weather tests), (*Proteins, Metabolism), Body weight, Casein, Tissues (Biology), Nutrition, Fats, Rats.

Male Sprague-Dawley rats were fed a nitrogen-free diet at 25 C and at 7 C. At the end of a 10-day depletion period, they were fed diets containing 6, 9, 12, 15 and 18% casein for 14 days. Carcass analyses (minus liver and intestinal contents) were then carried out for protein, water and fat. At 6% casein, carcass accretion consisted mainly of fat in both environmental groups, with very little nitrogen increment. At higher levels of casein, tissue protein accretion reflected dietary protein increment at both temperatures, although fat accretion was somewhat reduced at 7 C. In a second experiment, fibrin at 6 and 9% was compared with casein during repletion at both temperatures. Fat accretion at both levels of fibrin was significantly reduced at 7 C, although other tissue increments were not appreciably affected. These results indicate that weight gains at low levels of protein consist mainly of nonprotein components and that cold exposure tends to 'normalize' tissue accretion at these low levels. The increased intake of protein resulting from the increased consumption of food in the cold is a possible explanation. (Author)

**AD-462 623** **Field 6E**
**CFSTI Price: HC$1.00**
Arctic Aeromedical Lab., Fort Wainwright, Alaska.
**EVALUATION OF PNEUMATIC SPLINTS,**
by W. W. Millard and J. R. Schumann. Jan 65, 14p AAL-TDR-64-22
Proj. AF-8238,
Task 823802
Distribution: No limitation.

Descriptors: (*Prosthetics, Inflatable structures), (*Inflatable structures, Medical supplies), Cold weather tests, Effectiveness, Fractures (Bone), Reduction, Interference, Blood circulation, Wounds + injuries, Temperature, Blankets, Surgery, Veins, Control, Hemorrhage.

A study was undertaken to evaluate pneumatic splints and to determine their adequacy at low environmental temperatures. Six test subjects were used under various conditions. Splints were field and laboratory tested. Skin temperatures and peripheral blood flow were measured by electronic means and digital plethysmography, respectively. The splints provide a quick, efficient method of immobilization, eliminate the need for padding as required by conventional splints and can be applied by personnel who have a minimum knowledge of basic first aid. The pneumatic splint was used during vein ligations on three patients at Bassett Army Hospital. Discoloration and extravasations were markedly decreased as compared with wrapping with elastic bandages. The patients had less pain and were discharged sooner. They were not given elastic wrapping or elastic stockings, and there was minimal edema. (Author)

**AD-462 624** **Field 6G**
**CFSTI Price: HC$1.00**
Arctic Aeromedical Lab., Fort Wainwright, Alaska.
**COLD TEST EVALUATION OF SOME COMPONENTS OF THE NASA MERCURY SURVIVAL KIT,**
by Paul A. Albert. Feb 65, 22p AAL-TDR-64-24
Proj. AF-8238,
Task 823802
Distribution: No limitation.

Descriptors: (*Survival kits, Cold weather tests), Life rafts, Life preservers, Transmitter-receivers, Water tanks, Operation, Acceptability, Heat transfer, Water, Temperature, Atmospheric temperature, Body temperature, Structural properties, Thermal insulation, Flashlights, Food, Experimental data, Graphics.

Identifiers: Mercury project.

Components of Project Mercury Survival Equipment were subjected to evaluation tests to determine their operational adequacy under low environmental temperatures. In-house comparative testing was performed on the NASA and the standard MB-4 one-man life rafts, to determine which raft provided greater protection against heat loss from subject to surroundings. Instrumented

subjects, with and without air pillow for buttock insulation, were seated in the rafts in water at 2.0 C and ambient air temperatures of O and -18C, for 2-hour periods. Thermal variations were assayed by measuring rectal and selected skin temperatures. The raft and other components, such as the NASA life vest, strobe light, transceiver and water container, were also cold-soaked at -30C, to determine structural integrity and certain operational characteristics, both during the exposure and after rewarming to a more temperate state. Results obtained indicate that the NASA raft and, under certain conditions, possibly the water container are superior to current Air Force items for survival in cold environments. Also, the inclusion of an air pillow for buttocks insulation as a part of the raft assembly was indicated. Means for improving the global capability of the survival kit are suggested. (Author)

**AD-462 767** **Field 6Q**
**CFSTI Price: HC$2.00**
Arctic Aeromedical Lab., Fort Wainwright, Alaska.
**PROJECT COLD CASE.**
Technical documentary rept.,
by Frederick A. Milan. Feb 65, 30p AAL-TDR-64-23
Proj. AF-8238,
Task 823801
Distribution: No limitation.

Descriptors: (*Flight clothing, Pressure suits), (*Pressure suits, Cold weather tests), Flight crews, High altitude, Effectiveness, Survival, Arctic regions, Simulation.

Identifiers: Cold Case project.

The results of Project Cold Case, an investigation of the cold land survival capabilities of Air Force pilots wearing the Full Pressure High Altitude Flying Outfit (A/P22S-2 and A/P 22S-3) are presented in this report. Six subjects wearing these garments were placed under simulated survival conditions in a wooded area of interior Alaska near Fairbanks. Ambient air temperatures reached -30 F and were below -27 F for at least 50% of the time. On the third day air temperatures rose and remained at -10 F until the conclusion of the test. The test lasted for 72 hours. Two subjects wearing the Full Pressure Suit without additional clothing survived for 11 and 30 hours. At the end of this time they were fatigued and moderately hypothermic. Two subjects with the Full Pressure Suit plus a nine-piece down-filled survival outfit (Clothing Outfit, arctic survival) survived for 52 and 72 hours. The 52-hour survivor suffered a noncold injury which necessitated his removal. Two Subjects with the Full Pressure Suit plus an experimental ADC WalkAround Sleeping Bag survived for 72 hours each. (Author)

**AD-466 946** **Field 6A**
**CFSTI Prices: HC$1.00 MF$0.50**
Army Medical Research Lab., Fort Knox, Ky. Dept. of Biochemistry.
**STOICHIOMETRIC RELATIONSHIPS IN CORTISOL INDUCED SWELLING OF RAT LIVER MITOCHONDRIA,**
by F. DeVenuto and U. Westphal. 31 Mar 65, 12p Rept. no. 621
Proj. DA-3A014501B71P,
Task 03
Distribution: No limitation.

Descriptors: (*Corticosteroid agents, Metabolism), (*Biochemistry, Corticosteroid agents), Liver, Mitochondria, Optical phenomena, Density, Molecular properties, Permeability, Volume, Rats.

The influence of cortisol on the swelling of rat liver mitochondria was studied by measuring the changes of optical density of mitochondrial suspensions in the presence and in the absence of the steroid. The results show that an increase of the swelling rate under the influence of cortisol is apparent 12 and 44 minutes after mixing the hormones and the mitochondrial suspension; the effect disappears after a few hours. Maximal acceleration is observed at 1/10 to the 9th power M cortisol. At this steroid concentration the ratio of cortisol molecules per mitochondrion is approximately 1000:1. This is the same order of magnitude that has previously been observed in spontaneous beinding of cortisol to rat liver mitochondria. (Author)

**AD-466 947** **Field 6A**
**CFSTI Prices: HC$1.00 MF$0.50**
Army Medical Research Lab., Fort Knox, Ky. Dept. of Biochemistry.
**EFFECT OF ENZYMATIC FUNCTIONAL GROUP INHIBITORS ON THE ESTERASES OF CROTALUS ATROX VENOM,**
by John H. Brown and Mary E. Bowles. 23 Apr 65, 17p Rept. no. 627
Proj. DA-3A014501B71P,
Task 11
Distribution: No limitation.

Descriptors: (*Venoms, Biochemistry), (*Enzymes, Venoms), Organic phosphorus compounds, Reptiles, Carboxylic ester hydrolases, Phosphorylation, Toxicity, Inhibition, pH, Hydrolysis, Metalorganic compounds, Ions, Alkaline earth metals.

The activities of phosphodiesterase, phosphomonoesterase and esterase in Crotalus atrox venom can be completely inhibited by one or more of the following enzymatic functional group-specific reagents: 2-mercaptoethanol, 2,3-dimercaptopropanol, p-hydroxymercuibenzoate, iodoacetamide, diisopropyl fluorophosphate, ethylenediamine tetraacetic acid, N-bromosuccinimide. Phosphodiesterase was activated by the divalent cations of iron, cobalt, nickel, manganese, zinc and the alkaline earths; phosphomonoesterase was activated by calcium, iron, cobalt and zinc; esterase was not activated by metal ions. In general, the divalent cations of cadmium, mercury and copper inhibited all three enzymes. (Author)

**AD-466 948** **Field 6A**
**CFSTI Prices: HC$1.00 MF$0.50**
Army Medical Research Lab., Fort Knox, Ky. Dept. of Biochemistry.
**DETOXIFICATION OF CROTALUS ATROX VENOM BY PHOTOOXIDATION IN THE PRESENCE OF METHYLENE BLUE,**
by W. Kocholaty. 10 May 65, 23p Rept. no. 628
Proj. DA-3A014501B71P,
Task 11
Distribution: No limitation.

Descriptors: (*Venoms, Detoxification), (*Photochemistry, Venoms), Biochemistry, Immunity, Oxidation, Antigens + antibodies, Biological stains, Toxicity, Reptiles, Enzymes, pH, Photosensitivity (Biological).

Photooxidation of crude Crotalus atrox venom by visible light in the presence of traces of methylene blue resulted in a detoxification of the venom. The detoxified venom when injected in the rabbits gave rise to antibodies which protected mice against the action of the native venom. Various changes occurring during photooxidation in the properties of the venom are described. (Author)

**AD-469 352** **Field 6R, 15C**
**CFSTI Prices: HC$2.00 MF$0.50**
Defense Atomic Support Agency, Washington, D. C.
**LIST OF MILITARY AND CIVIL DEFENSE RADIAC DEVICES, 1965.**
Revised ed.
5 Aug 65, 34p DASA-1243-Rev
Revision of 1964 edition. Distribution: No limitation.

Descriptors: (*Health physics instrumentation, Bibliographies), (*Radiation measurement systems, Bibliographies), (*Civil defense systems, Radiation measurement systems), Dosimeters, Radiation monitors, Department of Defense.

A compilation of radiac devices currently available to the Department of Defense is presented. The list is separated into rate meters, dosimeters, miscellaneous radiac equipment for calibration and special purposes, and major research and development items. Each item includes nomenclature, classification, federal stock number, cost, sponsoring agency and a description of the item. (Author)

**COO-1170-1** **Field 6C**
**CFSTI Prices: HC$1.00 MF$0.50**
Iowa State Univ. of Science and Technology, Ames. Inst. for Atomic Research.
**EFFECTS OF SUBCUTANEOUS IMPLANTATION OF RARE-EARTH METALS,**
by Richard B. Talbot, Fred C. Davison, and John W.Green. May 65, 20p
Contract AT (11-1)-1170
Prepared in cooperation with Iowa State Univ. of Science and Tech., Ames. Coll. of Veterinary Medicine. Distribution: No limitation.

Descriptors: (*Rare earth elements, Veterinary medicine), (*Veterinary medicine, Rare earth elements).

**COO-1226-8** **Field 6R, 18D**
**CFSTI Prices: HC$2.00 MF$0.50**
Phylatron Corp., Columbus, Ohio.
**DEVELOPMENT OF A FAST NEUTRON DOSIMETRY SYSTEM,**
by B. H. Chase, W. H. Closser, R. R. Speers, J. M. Swartz, and M. O. Thurston. 1964, 43p
Contract AT (11-1)-1226
Distribution: No limitation.

Descriptors: (*Fast neutrons, Dosimeters), (*Health physics instrumentation, Fast neutrons).

**FS2.62:50** **Field 6M, 6E**
**CFSTI Price: MF$0.75**
Public Health Service, Washington, D. C.
**UNITED STATES-U.S.S.R. MEDICAL EXCHANGE MISSIONS, 1956.**
1956, 98p PHS-mono-50, PHS-
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50.

Descriptors: (*United States, Medicine), (*USSR, Medicine), Public health, Virus diseases, Poliomyelitis virus, Arboviruses, Vaccines, Bacteria, Immunity, Etiology, Epidemiology, Disease vectors, Pathology, Medical personnel, Scientific organizations, Periodicals.

Early in 1956, the Public Health Service was called upon to organize a program of exchanges in medicine between the United States and the Soviet Union. The Soviet Government had made a request to the United States Department of State for a mission on poliomyelitis to the United States, and the first step in the exchange program was to devise and supervise a schedule for this mission. The mission arrived in the United States on January 18 and left on February 25, 1956. The second step was the formulation and accomplishment of a reciprocal mission to the Soviet Union. This mission left the United States on February 25 and completed its tour on March 28, 1956. The third step of the program, as yet incomplete, was the development of a plan for a long-term exchange of information and personnel between the United States and the Soviet Union. The results of the first completed exchange mission are reviewed in this report. Various reports of the American personnel participating in the missions are also included in this monograph.

**N65-16430** **Field 6T**
**CFSTI Prices: HC$1.00 MF$0.50**
Medical Coll. of Virginia, Richmond.
**NASA PROGRESS REPORT SINCE MAY 1962.**
Summary rept.
1965, 2p
Grant NsG156 61
NASA CR-50682
Distribution: No limitation.

Descriptors: (*Cerebrovascular system, Carbon dioxide).

**N65-16478** **Field 6C**
**CFSTI Prices: HC$3.00 MF$0.50**
Resources Research, Inc., Washington, D. C.
**RADIOISOTOPIC BIOCHEMICAL PROBE FOR EXTRATERRESTRIAL LIFE,**
Quarterly progress report no. 10,
by G. V. Levin. 25 Sep 63, 58p
Contract NASR-10
NASA CR-55535
Distribution: No limitation.

Descriptors: (*Space biology, Probes), (*Probes, Space biology).

**N65-16815** **Field 6C, 18B**
**CFSTI Prices: HC$2.00 MF$0.50**
Hazleton Labs., Inc., Falls Church, Va.
**RADIOISOTOPIC BIOCHEMICAL PROBE FOR EXTRATERRESTRIAL LIFE,**
Quarterly progress rept no. 15,
by N. H. Horowitz and G. V. Levin. Dec 64, 43p
Contract NASR-10
NASA CR-60709
Distribution: No limitation.

Descriptors: (*Space biology, Radioactive isotopes), (*Radioactive isotopes, Space biology).

**N65-16826** **Field 6C**
**CFSTI Prices: HC$7.00 MF$1.75**
Biological Sciences Communication Project. George Washington Un., Washington, D. C.
**SPACE BIOLOGY AND SPACE BIOSCIENCE RESOURCES BSCP COMMUNIQUE,**
by C. W. Shilling, and J. W. Tyson. 15 Feb 64, 311p
Grant NSG-485
NASA CR-53419
Distribution: No limitation.

Descriptors: (*Space biology, Scientific personnel), (*Scientific personnel, Space biology).

**N65-20981** **Field 6C, 6F**
**CFSTI Prices: HC$1.00 MF$0.50**
California Univ., Los Angeles. Brain Research Inst.
**EFFECT OF SPACE ENVIRONMENT ON CIRCADIAN RHYTHMS OF PLANTS, FOR THE PURPOSE OF DEFINING AND VERIFYING AN EXPERIMENT SUITABLE FOR USE IN A BIOSATELLITE.**
Semi-annual rept., 1 Sep 63-1 Mar 64,
by J. D. French and T. Hoshizaki. 1 Mar 64, 9p
Grant NsG-528
NASA CR-53457
Distribution: No limitation.

Descriptors: (*Rhythm (Biology), Space environmental conditions), (*Space biology, Rhythm (Biology)), (*Plants (Botany), Space biology).

**N65-27517** **Field 6M**
**CFSTI Prices: HC$1.00 MF$0.50**
Army Biological Labs., Fort Detrick, Md.
**DRY HEAT STERILIZATION OF MICROORGANISMS AT 105C,**
by Dorothy M. Portner. 7 Jun 65, 5p
Contract no. NASA Order R-35
NASA CR-63665
Distribution: No limitation.

Descriptors: (*Microorganisms, Purification).

**Patent 3,217,421** **Field 6H**
**METHOD AND APPARATUS FOR TREATING FOODS WITH GASEOUS MEDIA.**
Patent assigned to Agriculture,
by Edison Lowe, Everett L. Durkee andWalter E. Hamilton. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Fruits, Coatings), Waxes, Processing, Patents.

Hot, wax-coated raisins are cooled with a minimum of clumping by the process. The raisins are deposited on a perforated carrier and transported through a cooling zone. The raisins are subjected to alternate quiescent resting on the carrier and suspension in an air stream until the wax coating is congealed.

**Patent 3,218,475** **Field 6D**
**ARTIFICIAL NEURON.**
Patent assigned to Navy,
by Frederick F. Hiltz. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Nerve cells, Simulation), (*Bionics, Nerve cells), Nervous system, Analog systems, Circuits, Patents.

The electronic analog simulator utilizes a linear operational amplifier circuit in its forward path, and a nonlinear element in its feedback path. The analog circuit exhibits neuronal characteristics. The neuron model includes a synapse and a neuron. The synapse provides components by which indirect or pre-synaptic input signals are summed, shaped and prepared prior to their application to the neuron. Transistors are used in the circuits.

**PB-168 579** **Field 6A, 7C, 6H**
**CFSTI Prices: HC$1.00 MF$0.50**
Bjorksten Research Labs., Inc., Madison, Wis.
**STUDY OF SECONDARY DETERIORATION IN PARTIALLY OXIDIZED LIPIDS.**
Rept. no. 2 (progress), 15 Apr-15 Jul 60,
by Fred Andrews. 15 Jul 60, 13p
Contract DA-19-129-qm-1549,
Proj. DA-7-84-13-002B
QMCIAF L-400-2;
AD 250 373
See also AD-244 473. Distribution: No limitation.

Descriptors: (*Lipids, Degradation), (*Proteins, Crosslinking (Chemistry)), (*Gelatins, Hydrolysis), (*Albumins, Hydrolysis), (*Insulin, Biological assay), Fatty acid esters, Linoleic acids, Trypsin, Foams, Oxidation, Nitrogen, Glycoproteins.

Identifiers: Methyl linoleates, Ovomucoids.

Gelatin and egg albumin foams containg methyl linoleate were prepared, and after aging in air were hydrolyzed with trypsin. The presence of autoxidized methyl linoleate in the foam was found to significantly alter the hydrolytic properties of trypsin toward the test proteins. In gelatin it was found that 22% less nitrogen was liberated in a fat oxidized sample than in a control foam. This result is interpreted as confirming evidence that proteins in intimate contact with methyl linoleate become cross-linked during aeration of the mixture. In egg albumin, on the other hand, the presence of autoxidized methyl linoleate in the foam greatly enhances the hydrolytic powers of trypsin. This apparent inconsistency in the enzyme data may be explained as being due to the presence of a strong trypsin inhibitor, ovomucoid, which is a common contaminant in impure egg albumin. It would appear that ovomucoid is preferentially attacked by the reactive lipie intermediates. Preliminary bioassay studies of the insulin-methyl linoleate interaction indicate that insulin bio-assay provides a sensitive means of following fatprotein interactions. (Author)

**PB-168 597** **Field 6D, 9B**
**CFSTI Prices: HC$1.00 MF$0.50**
Swarthmore Coll., Pa. Dept. of Electrical Engineering.
**PATTERN RECOGNITION BY SELECTION OF REPRESENTATIVE SUBSETS.**
Progress rept.,
by Carl Barus. 29 Jan 63, 19p
Grant NSF-G5945
Distribution: No limitation.

Descriptors: (*Pattern recognition, Learning machines), Simulation, Theory.

Identifiers: Alpha-numeric symbols, Bayes' theorem.

A subset of representative specimens of each pattern is stored in order to form a model of the pattern's distribution. A learning program for selecting suitably representative subsets is described. The operation of the program has been simulated, using a two-letter alphabet of hand-drawn characters. (Author)

**PB-168 766** **Field 6C**
**CFSTI Prices: HC$2.00 MF$0.50**
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
**RYTHMES DE VEGETATION DE QUELQUES ESPECES LIGNEUSES (ABSORPTION RADICULAIRE ET TRANSPORT DE SELS ALCALINO-TERREUX (45Ca, 140Ba) AU COURS D'UN CYCLE VEGETATIF COMPLET MARS 1963-AVRIL 1964) (Vegetative Rhythms of Some Woody Species),**
by Janine Gagnaire, J. M. Gerard and M. T. Roux-Aubert. Oct 65, 48p CEA-R-2825
Distribution: No limitation. Text in French; Attached Summary in English.

Descriptors: (*Trees, Rhythm (Biology)), (*Rhythm (Biology), Absorption (Biological)), (*Absorption (Biological), Trees), Calcium.

In laboratory conditions from March 1963 to April 1964, variations of calcium absorption by roots and translocation speed towards aerial parts of young Norway spruce (Picea excelsa) in hydroponic growing, presenting 5 distinct stages in a vegetative cycle: (1) From early April until the end of May a rapid rising of minerals from roots to young parts of the tree, associated with a redistribution of calcium formerly fixed in tissues; (2) In June-July, an equilibrium in mineral exchanges between the different parts of the tree; (3) From early August to the end of October, a pre-dormancy phase marked by a slowing of translocation; (4) In November-December, an absolute dormancy period; (5) From January to March, a postdormancy phase in which root absorption and translocation to aerial parts are decreased.

**PB-168 777** **Field 6R**
**CFSTI Prices: HC$3.00 MF$0.75**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**DOSIMETRIE DES NEUTRONS AU MOYEN DE COMPTEURS PROPORTIONNELS A PAROI EQUIVALENTE AUX TISSUS (NEUTRON DOSIMETRY USING PROPORTIONAL COUNTERS WITH TISSUE EQUIVALENT WALLS).**
Doctoral thesis in French,
by Herve de Kerviler. 1965, 66p CEA-R-2891
Distribution: No limitation. Text in French; Attached Summary in English.

Descriptors: (*Neutrons, Radiobiology), (*Radiobiology, Neutrons), Dosimeters, Tissues (Biology), Radiological dosage, Radiation effects.

The calculation method of the neutron absorbed dose in a material is described and the conditions necessary for this material to be equivalent to biological tissue are derived. Various proportional counters were constructed with walls in new tissue equivalent material and filled with various gases. The multiplication factor and neutron energy response of these counters were investigated and compared with those obtained with ethylene lined polyethylene counters. The working conditions of such proportional counters for neutron dosimetry in the energy range of 0.01 to 15 MeV are specified. (Author)

**PB-168 862** **Field 6E, 6L**
**CFSTI Prices: HC$1.00 MF$0.50**
Autonetics, Anaheim, Calif.
**A PNEUMATIC DRIVER FOR SURGICALLY IMPLANTED MYOCARDIAL AUGMENTATION DEVICES,**
by Victor W. Bolie and Thomas C. Kirstein. 23 Sep 65, 22p C5-1691/3111
Grant PHS-PH43-64-963
Distribution: No limitation.

Descriptors: (*Heart, Mechanical organs), (*Mechanical organs, Pneumatic devices), (*Pneumatic devices, Heart), Implants, Relaxation oscillators, Circuits, Prosthetics, Tests.

The pneumatic driver was developed under contract from the National Heart Institute. Basically, the concept consists of a solid-state relaxation oscillator with adjustable rate and pulse width to actuate a four-way, two-position solenoid valve. During diastole the solenoid valve directs air from an adjustable pressure source into a variable volume storage tank and simultaneously exposes the air chamber of a pneumatically actuated heart prosthetic device to a suction of adjustable strength. During systole, the vacuum and high pressure lines are isolated and air in the storage tank is discharged into the prosthesis. This approach provides rapid delivery of pneumatic energy to the prosthesis, especially during the start of systole and eliminates valve-stiction catastrophes by providing only a limited amount of systolic drive. The pneumatic pressure cycling system was designed to drive a dog-sized, single-chambered heart massage prosthesis, and although the storage tank volume and pressure were variable, the maximum capacity was not adequate for experiments with larger animals. The cycling system is capable of providing the pneumatic energy requirements for various double-ventricle artificial hearts or myocardial augmentation devices. It can provide ample power for a man-sized artificial heart and has an adjustment range sufficient for use with dogs and various other experimental animals.

## 7. CHEMISTRY

**AD-465 900** **Field 7C, 7A**
**CFSTI Price: HC$1.00**
Forest Products Lab., Madison Wis.
**FURFURAL YIELD AND DECOMPOSITION IN SODIUM 2,4-DIMETHYLBENZINESULFONATE-SULFURIC ACID-WATER SOLUTIONS.**
Research paper,
by John M. Smuk and Lawrence L. Zoch. Jun 65, 13p FPL-32
Distribution: No limitation.

Descriptors: (*Furaldehydes, Synthesis (Chemistry)), (*Sulfonates, Decomposition), (*Xylenes, Decomposition), Sulfuric acid, Water, Xylose, Wastes (Industrial), Sodium compounds, Reaction kinetics.

Identifiers: Sodium xylene sulfonates.

Batch-type microreactors (about 1/40 milliliter of reactants) were used to measure furfural yields from acidified xylose solutions containing sodium xylenesulfonate. Initial xylose concentration was 0.666 molar. Two levels of sulfuric acid catalyst were used, 0.05 and 0.2 molar, while the sodium xylenesulfonate concentration ranged from 0 to 1.68 molar (close to saturation at room temperature). The reaction temperatures were 150, 200, and 240C. It was found that presence of the salt did not affect the quantity of furfural produced, but greatly increased the rate of formation. The regular increase in rate of furfural formation was directly related to the increase in the rate of xylose decomposition, and furfural yields for all salt and acid concentrations at a given temperature were uniquely described by the xylose halflife.

**BNL-9104** **Field 7C**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**GAMMA-RADIATION-INDUCED POLYMERIZATION OF ETHYLENE,**
by L. E. Kukacka, P. Colombo and M. Steinberg. 1965, 6p CONF-650801-1
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Ethylene, Polymerization), (*Polymerization, Gamma rays).

**BNWL-SA-199** **Field 7E**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**FREE RADICALS FORMED BY GAMMA IRRADIATION OF ORGANIC SOLUTES IN WATER,**
by D. R. Kalkwari and R. N. Diebel. 18 May 65, 15p CONF-650628-1
Contract ATC45-1)-1830
Prepared for presentation to American Chemical Society, Northwest Regional Meeting, Richland, Wash. Distribution: No limitation.

Descriptors: (*Organic compounds, Radiation damage), (*Gamma rays, Organic compounds), (*Free radicals, Radiation damage).

**C13.44:25** **Field 7D**
**CFSTI Price: MF$0.75**
National Bureau of Standards, Washington, D. C.
**STANDARD X-RAY DIFFRACTION POWDER PATTERNS,**
by Howard E. Swanson, Marlene Cook Morris, Eloise H. Evans, and Linda Ulmer. 31 Jul 64, 69p NBS Mono-25 sec-3
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D.C., 20402, $0.40.

Descriptors: (*X-ray diffraction analysis, Powders), (*Powders, X-ray diffraction analysis), (*Standards, X-ray diffraction analysis), Chemical compounds, Alloys.

Standard x-ray diffraction powder patterns are presented for the following fifty-one substances: 3A12O3.2SiO2, (mullite); (NH4)2BeF4; NH4BF4; Sb2Se3*; Sb2Te3*; As2O3*, claudetite; BaBr2.H2O*; BaSnO3; BiPO4 (monoclinic); Bi2Te3, (tellurobismuthite); Bi2O3, (bismite); Cd (ClO4)2.6H2O*; CdTe; Ca5F (PO4)3, (fluorapatite); CeNbTiO6, (eschynite); Cs2CrO4*; CsF; CoSiF6.-6H2O*; Co (C1O4)2.6H2O*; CuSO4, (chalcocyanite); DyAsO4*; ErAsO4*; EuAsO4; GaAs*; HoAsO4*; InAs; LaAsO4*; LaNbTiO6*; Li3PO4, (lithiophosphate) low form; Li3PO4 high form; MgNH4PO46H2O, (struvite); KC1O3; KLiSO4*; K3CrO8*; K2Zn2V10O28.16H2O*; Rb2CrO4*; AgSbTe2*; NaMg3A16B3Si6O27 (OH)4*, dravite; Na3P3O9; Na3P3O9H2O; SnF2*; SrO.B2O3; TbAsO4*; T1CrO4*; TmAsO4*; TiO2, brookite; and ZnTe. Twenty-one are to replace patterns already given in the X-ray Powder Data File issued by the American Society for Testing and Materials, and thirty patterns indicated by asterisks are for substances not previously included. The patterns were made with a Geiger counter x-ray diffractometer, using samples of high purity. When possible, the d-values were assigned Miller indices determined by comparison with calculated interplanar spacings and from space group extinctions. The densities and lattice constants were calculated, and the refractive indices were measured whenever possible. (Author)

**C13.46:323** **Field 7D**
**CFSTI Prices: HC$0.25 MF$0.50**
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
**REFRACTIVE INDEX AND DISPERSION OF LIQUID HYDROGEN.**
Technical note,
by R. J. Corruccini. 24 Sep 65, 27p
NBS TN-323
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.25.

Descriptors: (*Hydrogen, Liquefied gases), (*Refractive index, Hydrogen), Optical properties, Scattering, Light, Bubble chambers.

The published experimental values of the refractive index of liquid hydrogen have been correlated by calculating and comparing the values of the Lorentz-Lorenz ratio as a function of wavelength. Because of the scatter found by this analysis, it is proposed at more accurate values can be calculated from available data of other kinds, namely, the dielectric constants determined by Stewart and the optical dispersion determined for the gas at STP. Formulas for this calculation are given. (Author)

**C13.46-316** **Field 7D**
**CFSTI Price: MF$0.50**
National Bureau of Standards, Boulder, Colo. Inst. for Materials Research.
**SOLUBILITY OF SOLIDS IN DENSE GASES.**
Technical note,
by J. M. Prausnitz. Jul 65, 51p
NBS TN-316
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.35.

Descriptors: (*Solids, Solubility), Gases, Solutions, Thermodynamics, High-pressure research, Mathematical analysis.

The thermodynamics of solid-dense gas equilibria is discussed, and two techniques are described for calculating the solubility of a solid component in a gas at high pressure. The first one is based on the recent empirical equation of state of Redlich which, in turn, is derived from Pitzer's generalized tables of fluidphase volumetric properties. The second one is based on the Hildebrand-Scatchard theory of solutions. Both methods give good semiquantitative results but cannot accurately predict solubilities from purecomponent data alone. (Author)

**CNLM-6337** **Field 7B, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Pratt and Whitney Aircraft, Middletown, Conn. Connecticut Advanced Nuclear Engineering Lab.
**STUDIES CONCERNING THE CHEMICAL STATE OF CARBON, NITROGEN AND OXYGEN IN ALKALI METALS,**
by K. J. Kelly, E. W. Hobart, and R. G. Bjork. 14 Apr 65, 12p CONF-650411-5
Contract AT (30-1)-2789
Prepared for presentation at Joint NASA-AEC Liquid Metals Corrosion Meeting, Gatlinburg, Tenn. Distribution: No limitation.

Descriptors: (*Alkali metals, Chemical analysis), (*Nuclear engineering, Alkali metals).

**N65-19715** **Field 7D**
**CFSTI Prices: HC$2.00 MF$0.50**
National Bureau of Standards, Washington, D. C.
**MATRIX ISOLATION STUDY OF THE REACTION OF F ATOMS WITH CO. INFRARED AND ULTRAVIOLET SPECTRUM OF THE FREE RADICAL FCO,**
by Dolphus E. Milligan, Marilyn E. Jacox, Arnold M. Bass, John J. Comeford, and David E. Mann. 13 Nov 64, 37p
Contract NASA Order R-64
NASA CR-59935
Distribution: No limitation.

Descriptors: (*Free radicals, Spectra (Visible + ultraviolet)), (*Carbon monoxide, Free radicals), (*Spectra (Visible + ultraviolet), Free radicals), (*Fluorine, Free radicals).

**N65-21769** **Field 7D**
**CFSTI Prices: HC$1.00 MF$0.50**
Florida Univ., Gainesville. Quantum Theory Project.

**RECENT DEVELOPMENTS IN THE METHOD OF DIFFERENT ORBITALS FOR DIFFERENT SPINS,**
by Ruben Pauncz. 16 Mar 65, 12p
Grant NsG512
NASA CR-62213
Distribution: No limitation.

Descriptors: (*Molecular orbitals, Mathematical analysis).

**N65-22133** **Field 7D, 7B**
**CFSTI Prices: HC$4.00 MF$1.00**
Purdue Univ., Lafayette, Ind.
**THE ARC SPECTRUM OF TIN.**
Doctoral thesis,
by Wilfred Grenfell Brill. Jan 64, 126p
NASA CR-62284
Distribution: No limitation.

Descriptors: (*Tin, Spectroscopy).

**N65-23931** **Field 7B**
**CFSTI Prices: HC$5.00 MF$1.25**
Air Products and Chemicals, Inc., Allentown, Pa.
**A DESIGN STUDY OF A HELIUM RECOVERY SYSTEM FOR MILA, VOLUME II.**
Final rept.
1965, 188p
Contract NAS10-1472
NASA CR-62744
Distribution: No limitation.

Descriptors: (*Helium, Recovery).

**Patent 3,216,919** **Field 7A**
**ELECTROLYTIC GAS GENERATOR.**
Patent assigned to Navy,
by Joseph C. White and Sigmund Schuldiner. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Gas generating systems, Electrolysis), (*Oxygen, Gas generating systems), Water, Electrolytic cells, Electrodes, Cadium, Nickel alloys, Palladium alloys, Electrolytes.

The system is for the production of oxygen by the electrolysis of water. Paired electrolytic cells are designed for operation with an aqueous alkaline electrolyte. They are electrically connected in series for reversal of current flow and alternate production of oxygen therein. The cells have paired plate electrodes. One electrode is cadmium-active. The other is formed of nickel-palladium alloy containing from 0.1 to 2 percent by weight of palladium.

**Patent 3,217,046** **Field 7C**
**PROCESS FOR PRODUCING UNDECANEDIOIC ACID FROM PLANT SOURCES.**
Patent assigned to Agriculture,
by Kenneth L. Mikolajczak. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Carboxylic acids, Synthesis (Chemistry)), (*Plants (Botany), Carboxylic acids), (*Fatty acid esters, Synthesis (Chemistry)), Vegetable oils, Distillation, Oxidation, Seeds, Patents.

Identifiers: Pelargonic acid, Undecanedioic acid.

Undecanedioic acid, and also nonanoic acid, may be obtained in industrially attractive quantities by oxidatively cleaving cis-ll-eicosenoic acid per se or the methyl ester from the seed oils of a plant selected from the group Alyssum maritimum, Selenia grandis, and Marshallia caespitosa. Undecanedioic acid is useful in the preparation of polyamides, polyesters and polyanhydrides. Nonanoic acid is useful in the synthesis of plasticizers, synthetic flavors and as esters as a component of turbojet lubricants.

**PB-168 774** **Field 7D, 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**ETUDE DE L'ETAT 2 (1)S DE L'HELIUM PAR LA METHODE DE HARTREE-FOCK (STUDY OF THE 2 (1)S STATE OF HELIUM USING THE HARTREE-FOCK METHOD,**
by Jean-Leon Masse. Oct 65, 19p CEA-R-2855 Text in French; Attached Summary in English.
Distribution: No limitation.

Descriptors: (*Hartree-Fock approximation, Atomic orbitals), (*Atomic orbitals, Hartree-Fock approximation), (*Helium, Atomic energy levels), Wave functions.

The HARTREE-FOCK method has been widely applied to atoms and molecules. However, it raises special objections as regards excited states which generally include incompletely filled orbital groups. Particulary, in such a case, the hypothesis of orthogonal orbitals, which is generally admitted and which makes the formalism and the solution of equations far simpler, is not possible in any case. The terms (1s) (ns), n (1)S of helium, for n=2,3... show a simple example where the orbitals can no longer be supposed to be orthogonal. The HARTREEFOCK equations are solved for the (1s) (2s), 2 (1)S state, with the approximation of linear combinations of orbitals of a SLATER-type. The author obtains for this term an energy - 2,1433 a.u. and for the overlap (1s, 2s) - 0,08. (Author)

## 8. EARTH SCIENCES AND OCEANOGRAPHY

**AD-466 089** **Field 8F**
**CFSTI Prices: HC$2.00 MF$0.50**
Army Engineer Waterways Experiment Station, Vicksburg, Miss.
**ANALOGS OF YUMA TERRAIN IN THE SOUTHWEST UNITED STATES DESERT. VOLUME I.**
by C. R. Kolb and J. R. Van Lopik. Jun 63, 50p
Technical rept. 3-630; Rept. no. 5
Distribution: No limitation. This study is part of project entitled 'Military Evaluation of Geographic Areas'.

Descriptors: (*Deserts, Arizona), Terrain, Maps, Soils, Plants (Botany), Rock (Geology), Geography, Mapping, Tables, Ecology, Oregon, Idaho, Nevada, Utah, California, New Mexico, Mexico, Texas.

To evaluate the adequacy and suitability of the Yuma Test Station as a test site representative of world desert conditions, it was necessary to determine to what extent Yuma terrain types occur in the Southwest United States (SWUS) desert and other world deserts. For valid comparisons, a uniform system of describing, mapping, and comparing desert terrain is necessary. In Vol II of this report, both the Yuma Test Station and the SWUS desert are mapped in terms of general geometry, ground, and vegetation factors. The data mapped for each terrain factor in each desert area were then synthesized to establish the degree of analogy of a particular SWUS area with selected portions of the Yuma area. Final terraintype analog maps were prepared by superimposing the geometry, ground, and vegetation analog maps and stratifying the resulting combinations. Highly analogous SWUS desert tracts exhibit combinaions of terrain-factor mapping units found at Yuma, and the degree of analogy decreasing as the similarity to such combinations decreases. Vol I of the report summarizes the analogy, and describes and discusses the factors used and the mapping technique. Appendix A in a general discussion of the philosophy and problems associated with terrain analysis and comparison. (Author)

**AD-466 206** **Field 8F**
**CFSTI Prices: HC$3.00 MF$0.50**
Army Engineer Waterways Experiment Station, Vicksburg, Miss.
**ANALOGS OF YUMA TERRAIN IN THE NORTHWEST AFRICAN DESERT. VOLUME I,**
by J. R. Van Lopik, C. R. Kolb and J. H. Shamburger. Jun 65, 54p Rept. no. 6; Technical rept. 3-630
Proj. DA-I-T-0-25001-A-131
Distribution: No limitation.

Descriptors: (*Arizona, Deserts), (*North Africa, Deserts), Analog systems, Algeria, Maps, Terrain, Soils, Rock (Geology), Geography.

To evaluate the adequacy of the Yuma Proving Ground as a test site representative of world desert conditions, the extent of occurrence of Yuma terrain types in the Northwest African (NWA) and other world desert areas must be determined. In order to make valid comparisons, a uniform system of describing, mapping, and comparing desert terrain must be employed. In this report both the Yuma and NWA deserts are mapped in terms of general or aggregate terrain, geometry, ground and vegetation factors. General terrain factors include physiography, hypsometry, and landform-surface conditions. Geometry and ground factors are characteristic plan-profile, occurrence of slopes greater than 50 percent, characteristic slope, characteristic relief, soil type, soil consistency, and type of surface rock. Terrain-factor data are synthesized to establish the degree of analogy of a particular NWA area with selected portions of the Yuma Proving Ground. (Author)

**AD-466 271** **Field 8F, 5I**
**CFSTI Price: HC$5.00**
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
**ENVIRONMENTAL DESCRIPTIONS OF RANGER TRAINING AREAS. PART 1. MOUNTAIN TRAINING AREA, NORTH GEORGIA.**
1 Jun 63, 173p
Contract DA-22-079-eng-333
Distribution: No limitation.

Descriptors: (*Military training, Guerrilla warfare), (*Military facilities, Georgia), Armed forces (United States), Military training, Terrain, Rock (Geology), Meteorological parameters, Tests, Mountains, Plants (Botany), Sampling, Mapping, Geometry.

The primary objectives of this study are (1) to determine the magnitude and distribution of environmental factors which relate to the effectiveness of military operations, especially of the Ranger type. Five environmental components are herein considered: surface macrogeometry, surface microgeometry, surface composition, vegetation, and hydraulic geometry. (Author)

**N65-19856** **Field 8N**
**CFSTI Prices: HC$2.00 MF$0.50**
Smithsonian Institution, Cambridge, Mass. Astrophysical Observatory.
**NEW DETERMINATION OF ZONAL HARMONICS COEFFICIENTS OF THE EARTH'S GRAVITATIONAL POTENTIAL,**
by Yoshihide Kozai. 2 Nov 64, 42p Special rept. SAO-SR-165
NASA CR-57443
Distribution: No limitation.

Descriptors: (*Gravity, Harmonic analysis).

**PB-168 714** **Field 8M, 9B, 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Washington State Dept. of Highways.
**MAXIMUM DENSITY OF GRANULAR MATERIALS (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by Roger V. LeClerc and Henry E. Sandahl.
1965, 25p
BPR Program S-2
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Soils, Density), (*Programming (Computers), Soil compaction), Particles, Gravel.

Identifiers: IBM 650.

The program is used in conjunction with a laboratory method for determining the maximum compacted densities of coarse granular materials. The laboratory method is described in a paper which was presented at the Thirty-Sixth Annual Meeting of the Highway Research Board in January 1957, by Mr. H. W. Humphres, Senior Materials Engineer, Washington Department of Highways, titled 'A Method for Controlling Compaction of Granular Materials' and printed in Highway Research Board Bulletin 159. For any given granular material, the computer program determines the coordinates of points to be used in plotting a Maximum Density Curve and a Loose Density Curve. These curves are then plotted and furnished the field inspector for his use in controlling compaction of the material. When a field density test is made, the value obtained is compared with the plotted curves and the degree of compaction is evaluated. (Author)

**PB-168 727** **Field 8M, 9B, 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Texas State Highway Dept.
**TRIAXIAL TEST DATA REDUCTION BY ELECTRONIC COMPUTER METHOD (DEVELOPED FOR IBM-650 M.D.D.P.M.),**
by D. C. Greer. 1965, 15p
Distribution: No limitation.

Descriptors: (*Soils, Shear stresses), (*Shear stresses, Programming (Computers)), (*Programming (Computers), Shear stresses), Data, Reduction, Internal friction, Strain (Mechanics).

Identifiers: IBM 650.

The program was developed for the reduction of data from the triaxial shear test in the determination of the shearing strength of soil. The computer produces the data for plotting the stress-strain diagram and for determining the cohesion and the coefficient of internal friction either analytically, or graphically through the use of Mohr's stress circles. (Author)

**PB-168 801** **Field 8G, 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**THE EFFECTS OF HIGH PRESSURE ON ELECTROLYSIS AND THE ABSORPTION OF HYEEL AT AMBIENT AND ELEVATED TEMPERATURES,**
by T. P. Groeneveld, E. L. White, A. R. Elsea, W. R. Boyd, and D. W. Hoeppner. 12 Apr 65, 29p Proj. MOHOLE
Distribution: No limitation. Subcontracted to Battelle Memorial Inst., Columbus, Ohio.

Descriptors: (*Steel, Hydrogen embrittlement), (*Hydrogen, Absorption), Zinc, High-pressure research, Temperature, Electrolysis, Corrosion, Drilling, Pipes, Fracture (Mechanics), Corrosion inhibition.

Identifiers: Mohole project, Drill pipes.

In a study of the effect of pressure on the performance of a zinc-steel couple, it was shown that in the pressure range from 1 to 270 atmospheres, at room temperature, there was no significant change in the potential difference or in the current flowing between the two metals with increasing pressure in a solution of 3-1/2 percent NaCl. Also, it has been reported that the hydrogen over-voltage is reduced at higher pressures. (Author)

**PB-168 802** **Field 8G, 13H, 13K**
**CFSTI Prices: HC$3.00 MF$0.75**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, AUGUST 1 TO SEPTEMBER 1, 1964.**
1 Sep 64, 60p
Distribution: No limitation. Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 803.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Reviews), Drilling, Defects (Materials), Test methods, Bibliographies, Probes (Electromagnetic), Ultrasonic radiation, Hardness, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

The report presents a survey of literature, industry, government and other sources for purposes of determining if inspection techniques or equipment not heretofore employed in commercial oilfield tubular goods inspection may be fruitfully adapted to meet any or all of the requirements of Project Mohole.

**PB-168 803** **Field 8G, 13H, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, SEPTEMBER 1 TO OCTOBER 1, 1964.**
5 Oct 64, 5p
Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 805. Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Drilling, Defects (Materials), Test equipment, Instrumentation, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

**PB-168 804** **Field 8G, 13H, 13J**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, DECEMBER 1, 1964, TO JANUARY 1, 1965.**
11 Jan 65, 7p
Distribution: No limitation. Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 807.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Test equipment, Drilling, Defects (Materials), Gamma rays, Probes (Electromagnetic), Instrumentation, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

This progress report concerning the design and development of equipment and techniques for nondestructive pipe inspection indicates the drill pipe sonde to be progressing to that point where demonstrations of the equipment are planned for February. The launcher assembly was constructed and given an initial mechanical check-out. Wiring was started on the control systems, cable drum assembly, and diesel power plant. Load and regulation tests were made on the console power supplies. In regard to the casing sonde, preliminary designs and detailed drawings have been completed on the expandable shoe assembly. The magnetic unit of the casing sonde was disassembled to permit additional machining. (Author)

**PB-168 805** **Field 8G, 13H, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, NOVEMBER 1 TO DECEMBER 1, 1964.**
9 Dec 64, 6p
Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 810. Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing, Pipes), Drilling, Defects (Materials), Test equipment, Gamma rays, Probes (Electromagnetic), Instrumentation, Scanning, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

Progress is reported on work to develop nondestructive testing equipment for inspection of tubular goods, both on the drilling platform and at the pipe mills.

**PB-168 806** **Field 8G, 13H, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, MAY 1, 1965, TO JUNE 1, 1965.**
11 Jun 65, 20p
Subcontracted to AMF Tuboscope, Inc., Houston Tex. See also PB-168 811. Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Test equipment, Drilling, Sensitivity, Defects (Materials), Fracture (Mechanics), Ultrasonic radiation, Probes (Electromagnetic), Signal-to-noise ratio, Surface properties, Performance (Engineering), Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

Tests were conducted to determine the maximum sensitivity obtainable by electromagnetic pipe inspection. It was demonstrated that the sensitivity is affected by surface roughness. Several tool joint samples containing fatigue cracks in their thread roots have been inspected by black-light, ultrasonic, and electromagnetic techniques. These samples are currently being sectioned in order to compare the capabilities of each inspection technique. Although the indications received from both the ultrasonic and electromagnetic systems are very distinct, the ultrasonic unit records the flow signal with greater signal-to-noise ratio. It was found during these tests that alignment of the ultrasonic transducer, to obtain maximum sensitivity to a spiral flaw, was very critical. In a practical application of ultrasonic inspection, it would be necessary to know the lead angle of a small spiral seam to insure detection of the flaw. (Author)

**PB-168 807** **Field 8G, 13H, 13J**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, JANUARY 1, 1965 TO FEBRUARY 15, 1965.**
15 Feb 65, 20p
Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 804. Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Test equipment, Performance (Engineering), Defects (Materials), Instrumentation, Gamma rays, Probes (Electromagnetic), Thickness, Sensitivity, Tests, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casing.

The report concerns the design and development of equipment and techniques for nondestructive pipe inspection. Equipment performance tests are described. The report includes sample logs made during inspection of several joints of pipe and indicates the status of work on other items of equipment which were not included in the demonstration. Photographs are included which show the launcher, sonde, and instrument desk as demonstrated on February 12; the gamma ray wall thickness demonstration apparatus; and the 3-percent sensitivity feasibility test demonstration setup. (Author)

**PB-168 808** **Field 8G, 13H, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, MARCH 1, 1965, TO APRIL 1, 1965.**
12 Apr 65, 12p
See also PB-168 806. Subcontracted to AMF Tuboscope, Inc., Houston, Tex. Distribution: No

limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Test equipment, Drilling, Defects (Materials), Fracture (Mechanics), Instrumentation, Sensitivity, Electromagnetic waves, Magnetic fields, Signal-to-noise ratio, Ultrasonic radiation, Hardness, Recording systems.

Identifiers: Mohole project, Drill pipes, Casings.

Efforts to improve the sensitivity of the drill pipe sonde to both ID and OD cracks have been very successful. Utilization of several electronic signal conditioning techniques permitted an improvement in ID sensitivity to transverse flaws from 2 square mils to 0.4 square mils. This represents an improvement of approximately forty times that obtainable by present commercial field equipment. The sensitivity of the drill pipe sonde to OD transverse flaws was improved from 20 square mils to 9 square mils. The preliminary test runs of the riser casing sonde confirmed that an adequate magnetic field could be generated in the pipe wall within the power-handling capacity of standard logging cable. The very first run confirmed the sensitivity to pits extrapolated from the drill pipe sonde. Without the special circuitry of the drill pipe sonde, several of the prepared ID pits in the riser casing sample were detected. One pit 0.015 in. deep, representing only 3.4 percent penetration into the wall, was clearly detectable. During the reporting period, a depth-of-grind detector probe was adapted to an AMALOG search shoe and evaluated. Results were quite good during the first test run and it appears that no further work is necessary on this device, which has an additional advantage of acting as a failsafe circuit in that it detects lift-off of the search shoe. (Author)

**PB-168 809** **Field 8G, 13H, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT.**
18 Aug 64, 18p
Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 802. Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Drilling, Defects (Materials), Sensitivity, Instrumentation, Indentification, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

**PB-168 810** **Field 8G, 13H, 13J**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, OCTOBER 1 TO NOVEMBER 1, 1964.**
3 Nov 64, 7p
Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 807. Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Test equipment, Drilling, Defects (Materials), Gamma rays, Probes (Electromagnetic), Instrumentation, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

**PB-168 811** **Field 8G, 13H, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROJECT MOHOLE PROGRESS REPORT, JUNE 1 TO JULY 15, 1965.**
27 Aug 65, 7p
Distribution: No limitation. Subcontracted to AMF Tuboscope, Inc., Houston, Tex. See also PB-168 809.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Non-destructive testing), (*Non-destructive testing, Pipes), Test equipment, Drilling, Defects (Materials), Fracture (Mechanics), Ultrasonic radiation, Probes (Electromagnetic), Signal-tonoise ratio, Sensitivity, Electromagnetic waves.

Identifiers: Mohole project, Drill pipes, Casings.

Several demonstrations in tubular goods inspection techniques are described in this report. On one occasion, detection of spiral mill seams located in a 11 3/4-in. test sample was demonstrated, using both the ultrasonic and electromagnetic detection systems. A combination of both systems could readily detect flaws much smaller than 3 percent penetration of the pipe wall. The cold work detection system was demonstrated on two test samples. A signal-to-noise ratio of approximately 15.1 was received from a 3-percent stretched area. Therefore, detection of a 1/2percent stretched area should be easily obtained in a practical field inspection unit. The detection of holidays in zinc electroplated pipe, both horizontally and vertically, was demonstrated. In all cases, uncoated areas were clearly detected. At another time, the electromagnetic end area unit and the electromagnetic threadcheck unit, as well as the ultrasonic rope cut detector, were successfully demonstrated. Also, a riser casing sonde demonstration was repeated to show a substantial improvement in sensitivity. Further demonstrations of the drill pipe sonde were conducted to show ability to detect cracks equivalent to 3 sq mils in the upset area. Further tests were conducted to insure 2-sq mil ID sensitivity to flaws located in areas of positive and negative slope changes of the upset. (Author)

**PB-168 818** **Field 8G, 14B, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**DRILL PIPE FATIGUE TEST MACHINE LOAD MEASUREMENT.**
31 Aug 65, 13p
Proj. MOHOLE
Subcontracted to Budd Co., Philadelphia, Pa., Rept. no. EPD-8500-095-1780. Distribution: No limitation.

Descriptors: (*Pipes, Fatigue (Mechanics)), (*Fatigue (Mechanics), Test equipment), (*Test equipment, Pipes), Drilling, Loading (Mechanics), Measurement, Transducers, Rupture, Instrumentation, Strain gages, Electric bridges, Calibration.

Identifiers: Mohole project, Drill pipes.

**PB-168 819** **Field 8G, 11F, 13K**
**CFSTI Prices: HC$3.00 MF$0.75**
Brown and Root, Inc., Houston, Tex.
**A REVIEW OF THE CORROSION, FATIGUE, AND FRACTURE CHARACTERISTICS OF Ti-6Al-4V.**
Special rept.,
by D. W. Hoeppner, W. S. Hyler and E. White. 10 Aug 65, 71p
Proj. MOHOLE
Subcontracted to Battelle Memorial Inst., Columbus, Ohio. Distribution: No limitation.

Descriptors: (*Titanium alloys, Fatigue (Mechanics)), (*Pipes, Titanium alloys), (*Corrosion, Titanium alloys), (*Fracture (Mechanics), Titanium alloys), Aluminum alloys, Vanadium alloys, Drilling, Stress corrosion.

Identifiers: Titanium alloy 6Al 4V, Mohole project, Drill pipes.

The report summarizes pertinent information regarding the utilization of a titanium alloy as the drill string material in Project Mohole. Specific topics which are dealt with are related to the fatigue, corrosion, and fracture behavior of the Ti-6Al-4V alloy. Representative data are presented which serve as indicators of the performance which may be expected from the alloy. Having considered the properties of interest to application as a drill string material, the Ti-6Al-4V alloy, if economically producible in the form of 40- to 50-ft lengths of drill pipe, appears to be suitable as a drill string material. Its corrosion, fatigue, and particularly corrosion-fatigue properties are excellent. There is one potentially dangerous area in the use of the Ti-6Al-4V material which is related to the ability of the titanium base alloys to resist stress corrosion cracking in the presence of a crack. Other experimental studies appear to be necessary also. It is important that the propagation of fatigue cracks in a seawater and drilling mud environment be completely evaluated. Also, the fracture strength of flawed material should be evaluated. Some study of the potential problem of crevice corrosion is necessary. No data were found to exist regarding the axial fatigue behavior at low cyclic rates; therefore, axial fatigue tests should be performed at low cyclic rates in either seawater or drilling mud. (Author)

**PB-168 820** **Field 8G, 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**DIAMOND CORING TECHNIQUES FOR PROJECT MOHOLE,**
by Darrell Sims. Sep 65, 15p
Papers on Proj. MOHOLE delivered before the International Upper Mantle Symposia at Ottawa (Canada). Distribution: No limitation.

Descriptors: (*Well logging, Drilling), Diamonds, Drills, Axial-flow turbines, Pipes, Drilling machines.

Identifiers: Mohole project, Turbodrills.

**PB-168 821** **Field 8G, 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**DEEP HOLE SCIENTIFIC MEASUREMENTS FOR PROJECT MOHOLE,**
by W. P. Schneider. Sep 65, 10p
Papers on Proj. MOHOLE delivered before the International Upper Mantle Symposia at Ottawa (Canada). Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), Measurement, Drilling, Drills, Instrumentation, Diamond wheels.

Identifiers: Mohole project, Turbodrills.

**PB-168 822** **Field 8G, 20D**
**CFSTI Prices: HC$3.00 MF$0.75**
Brown and Root, Inc., Houston, Tex.
**HYDRAULIC REQUIREMENTS, PROJECT MOHOLE.**
Staff rept.
Aug 65, 54p
Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Cutting fluids, Drilling), (*Fluid mechanics, Cutting fluids), Pipes, Fluid flow, Graphics, Drills.

Identifiers: Mohole project, Casings, Drill pipes, Turbodrills.

The report provides all known data on fluid systems operational requirements for drilling the Mohole at the Maui site. This information provides the basis for fluid circulatory system pipe and equipment selection.

**PB-168 823** **Field 8G, 13K**
**CFSTI Prices: HC$3.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR JANUARY 15 TO MARCH 28, 1965.**
12 Apr 65, 52p
Proj. MOHOLE
Subcontracted to National Engineering Science Co., Pasadena, Calif. See also PB-168 824. Distribution: No limitation.

Descriptors: (*Pipes, Drilling), (*Stresses, Pipes), Programming (Computers), Stabilization systems, Deflection.

Identifiers: Mohole project, Drill pipes, Casings.

The report covers progress on the riser system stress analysis program. The studies concerned drill piperiser interaction, computer program improvements, equivalence of individual rings and a continuous guide shoe, and a review of General Motors' analysis of riser deflections. (Author)

**PB-168 824** **Field 8G, 13K, 11J**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR PERIOD ENDING MAY 12, 1965.**
13 May 65, 35p
Proj. MOHOLE
Subcontracted to National Engineering Science Co., Pasadena, Calif. See also PB-168 823. Distribution: No limitation.

Descriptors: (*Pipes, Drilling), (*Stresses, Pipes), Programming (Computers), Safety, Configuration, Drills, Stabilization systems, Buoys.

Identifiers: Mohole project, Casings, Drill pipes.

The reports covers progress on the riser system stress analysis program. Specific subjects reported upon are: computer program improvements, verticaltransverse coupling, emergency configuration, upper drill string configurations, and bit forces. In the supporting material of the report, clarification of the determination of drag coefficients for low aspect ratio buoys is included. (Author)

**PB-168 825** **Field 8G, 13I**
**CFSTI Prices: HC$3.00 MF$0.75**
Brown and Root, Inc., Houston, Tex.
**WIRELINE RETRACTABLE DIAMOND CORE BIT HEAD AND BARRELS.**
Stage A rept.
Jul 65, 66p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to Christensen Diamond Products Co., Salt Lake City, Utah. Engineering Dept.

Descriptors: (*Well logging, Drills), (*Drills, Well logging), Diamonds, Pipes, Wire, Recovery, Turbines, Mandrels.

Identifiers: Mohole project, Turbodrills.

A retractable coring bit system was designed specifically to recover a two-inch diameter core 30feet long when drilling a 9-7/8-inch diameter hole and tripping the retractable mechanism on wireline through the bore of four-inch inside-diameter drill pipe. The retractable diamond core bit is set into coring position and is later retracted using only a wireline. The wireline retracting and setting feature reduces the need for costly, slow round trips with the drill pipe to change bits. With this system, bits can be changed in 2 hours instead of 20. The system can be rotated below a turbodrill or by conventional rotary drive. The retractable core bit system consists of three diamond-set bit pads which are tripped as an assembly through the inside bore of the drill pipe, with the pads staggered one above the other. The pads are suspended from a carrier barrel on rods which space the pads in their proper running-in position. Each pad is pushed by camlike actions into position for coring as it reaches the bottom of the drive mandrel. The drive mandrel is threaded onto the bottom drill collar in the hole. The carrier barrel and inner barrel are slipped into position behind the pads to lock the pads in place before the coring operation begins. The bit is automatically retracted from the hole for inspection each time the core barrel is tripped out on the wireline. Theoretical studies of various possible Mohole coring systems have been completed with the results showing a major economic and time savings by using the combination of this retractable bit and a fourinch bore turbodrill for drilling the Mohole. (Author)

**PB-168 826** **Field 8G, 8C**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**LBS OVERSIDE TRANSDUCER CURRENT DEFLECTION.**
Aug 65, 14p
Proj. MOHOLE
Subcontracted to Honeywell, Inc., Minneapolis, Minn. Distribution: No limitation.

Descriptors: (*Ocean currents, Deflection), (*Oceanographic equipment, Deflection), Transducers, Cables (Mechanical), Stresses, Velocity, Tides.

Identifiers: MOHOLE project.

An analysis was made of the lateral deflection of the overside transducer in response to expected on-site water velocities. Plots of the results are attached. Each plot is for a different combination of depressor weight mass, cable length, cable diameter, and cable breaking strength.

**PB-168 827** **Field 8G, 9C**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**ELECTROMAGNETIC INTERFERENCE MEASUREMENTS.**
Test rept.,
by W. Slaton. 24 Aug 65, 45p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to Lockheed Electronics Co., Houston, Tex. Aerospace Systems.

Descriptors: (*Well logging, Feasibility studies), (*Radiofrequency interference, Electric motors), Direct current, Broadband, Drilling machines, Measurement, Generators, Electrical equipment, Electromagnetic shielding.

Identifiers: MOHOLE project.

A study was made to determine the level of broadband interference (noise) being generated and radiated from a pair of d-c motors which provide electric power to a dieselelectric oil well drilling machine. The test was conducted on-site, in open space, and under normal operating conditions of the test unit. The two identical d-c motors under test were manufactured by General Electric -- Model GE-752. They were located on the mud pump skid and both were operating simultaneously as in normal drilling use. An analysis of the test data indicates the presence of broadband radiated interference in excess of limits established by the governing specification. Investigation suggests, however, that the electromagnetic interference was not entirely caused by the d-c motors under test, but by additive interference from a control panel comprised of high current-carrying contacts, relays, solenoids, and switches, and by two generators (dc and ac) providing electrical power to the mud pumps. The recommendation for the Mohole platform drilling rig is that an effort should be made during installation to position the generators in shielded enclosures and to use appropriate shielding on all input power leads to the d-c motors. Additional shielding should also be used on and around the control panels. (Author)

**PB-168 828** **Field 8G, 13K**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR THE PERIOD ENDING JUNE 13, 1965.**
14 Jun 65, 35p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to National Engineering Science Co., Pasadena, Calif. See also PB-168 829.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Drilling), Torsion, Mathematical analysis, Structures, Programming (Computers), Stresses, Safety, Drills, Degradation.

Identifiers: Mohole project, Casings, Drill pipes.

The significance of riser torsion was investigated by the writing of the completely general, three-dimensional structural equations and examining the relative magnitude of the significant terms under a variety of conditions. No results are yet available. A combination of-analytic and experimental (computer) techniques was used to investigate the vertical-transverse coupling. The previously developed implicit computer program, utilizing varying spatial steps, for numerical analysis has been generalized to permit variable torsion, rigidity, mass, and drag, and has been checked out and confirmed. A rational method of treating the response to random excitation of a nonlinear damped structure has been developed, thus permitting substantial improvement in the accuracy of response calculations. The improved damping treatment results in significantly lower calculated peak stresses in the emergency configuration. Analysis of an upper drill string configuration has been performed, and it has been found that high stresses result from a rigid power sub and significant clearance between the string and the riser or guide shoe when the power sub is in a low position. Methods for improving the situation include designing compliance into the power sub and providing liners (rings, such as have been investigated for the riser) which effectively reduce clearance. Lowering of the drill string within the riser may be a serious condition. (Author)

**PB-168 829** **Field 8G, 13K**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR THE PERIOD ENDING JULY 11, 1965.**
14 Jul 65, 34p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to National Engineering Science Co., Pasadena, Calif. See also PB-168 830.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Drilling), Stresses, Programming (Computers), Stabilization systems, Safety, Drills, Degradation, Torsion.

Identifiers: MOHOLE project, Casings, Drill pipes.

Progress is reported in the following areas of riser casing stress analysis: Riser torsion studies continued along the lines indicated in the preceding progress report. Definitive results are expected during the next reporting period. A review of the work done by a Brown and Root consultant, Dr. Paslay, has shown that he established useful verifications of certain factors which were implicitly assumed in NESCO's work on vertical-transverse coupling. The implicit dynamics program has been completed and is ready for use in production runs. (A summary of all computer programs developed by NESCO for Mohole studies is enclosed with this progress report.) The combination of riserguide shoe characteristics to limit bending stresses has been determined. Results of new quantitative studies indicate peak (1/2 hr) riser forces of 300,000 lb. The significance of these forces can be determined only in light of the significance of vertical-transverse coupling. The effects of a tapered liner in reducing drill pipe stresses at the power sub have been investigated, and it has been found that substantial stress reductions may be made. Other methods of stress reduction are now under investigation. Sufficient investigations have been made to allow confidence that the most critical conditions have been included in the investigations. Results have continued to show low contact forces. (Author)

**PB-168 830** **Field 8G, 13K**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR THE PERIOD ENDING AUGUST 15, 1965.**
17 Aug 65, 29p
Proj. MOHOLE



799-657 O - 66 - 17

Distribution: No limitation. Subcontracted to National Engineering Science Co., Pasadena, Calif. See also PB-168 829.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Drilling), Stresses, Torsion, Motion, Stabilization systems, Joints, Drills, Degradation, Numerical analysis.

Identifiers: MOHOLE project.

Riser torsion analysis appears to be showing that slight torque is introduced into the riser by the out-of-plane bending associated with three-dimensional loading. Some coupling between y-z motions appears to be induced by high torsion in the drill string. It has been shown that vertical motion will have effects upon lateral motion. Studies of the effects of the time-history of an applied roll or pitch angle on the moments associated with that roll or pitch are indicating that the contribution to total moment of the elastic modal response is limited by damping to a small fraction of the quasi-static moment associated with the magnitude of the applied angle. A reexamination of the necessity for holding the low-angle stresses below 10,000 psi for the upper riser-guide show is advisable. It has been found that applying tension between the male and female members of a slip joint by means of external cables results in curvatures at critical points that are only slightly different from the curvatures found in a continuous beam. Control of drill string stresses at the power sub by means of a reduced rotary table diameter has been investigated with favorable results. A brief summary of the numerical results of the previously concluded bit-wear study is enclosed with this progress report.

**PB-168 831** **Field 8G, 11A, 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**CORROSION TESTS.**
13 Feb 65, 29p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to Shilstone Testing Lab., Houston, Tex., rept. no. L-2559.

Descriptors: (*Corrosion inhibition, Lubricant additives), (*Lubricant additives, Corrosion inhibition), Corrosion, Pipes.

Identifiers: MOHOLE project.

Corrosion tests were conducted for the purpose of evaluating the effectiveness of a cationic inhibitor and nonionic inhibitor when added to six different thread lubricants. Tests results indicate that the corrosion rate with commercial thread lubricants as supplied is at a relatively low level even under the stringent test conditions and, therefore, may not present any problem. (Author)

**PB-168 832** **Field 8G, 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**DOWNHOLE LOGGING CABLE TENSION DEVICE.**
Final rept., phase 1.
22 Mar 65, 25p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to Texaco Experiment, Inc., Richmond, Va., rept. nos. EXP-450, TP-245. See also PB-168 833.

Descriptors: (*Well logging, Feasibility studies), (*Tensiometers, Well logging), Electric cables, Pipes, Drilling, Electronic equipment, Strain gages, Packaging, Instrumentation.

Identifiers: MOHOLE project.

Preprototype design of the downhole logging cable tension device was completed; the pertinent sections of the subcontractor's final report, consisting of system description, description of each of the subsystems black boxes mentioned under 'System Description', component selection, and testing program, are presented here. The preprototype, consisting of a 'breadboard' model, was tested extensively, and all indications point to the feasibility of a field-test prototype capable of operating in the Mohole environment. (Author)

**PB-168 833** **Field 8G, 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**DOWNHOLE TENSION DEVICE.**
Letter progress repts. TM-1686, TM-1695, TM-1704, 28 Jun-30 Sep 65.
1965, 16p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to Texaco Experiment, Inc., Richmond, Va., Rept. no. EXP-450. See also PB-168 832.

Descriptors: (*Well logging, Feasibility studies), (*Tensiometers, Well logging), Pipes, Drilling, Electronic equipment, Transformers, Strain gages, Wire, Electric cables, Packaging, Instrumentation.

Identifiers: MOHOLE project.

Reports covering progress on the development and fabrication of a field prototype downhole tension device are presented. Transformer design data and results of the voltage breakdown tests are given. The report describes and illustrates the manner in which the strain transducers are mounted on the tension member, referred to as the weak point of the cable head assembly. The report presents data on the most recent tests performed on the experimental bifilar transformer windings and also includes a curve depicting the results of load test on the strain element. (Author)

**PB-168 834** **Field 8G, 13J**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**RESISTANCE AND YAW MOMENTS OF THE UNDERWATER PORTION OF THE MOHOLE DRILLING PLATFORM AS PREDICTED FROM MODEL TESTS,**
by William Kopko. Aug 64, 14p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to David Taylor Model Basin, Washington, D. C., rept. no. 1890.

Descriptors: (*Well logging, Feasibility studies), (*Floating bodies, Drilling machines), (*Hulls (Marine), Motion), Model tests, Drag, Yaw, Moments, Performance (Engineering).

Identifiers: MOHOLE project.

The report is presented to predict the performance characteristics of the Mohole drilling platform while in transit and while maintaining station at sea. The report discusses the predictions of the resistance and yaw moments of the underwater portion of the drilling platform at a 70-ft draft and for various angles of yaw. (Author)

**PB-168 835** **Field 8G, 11F, 20D**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**EFFECT OF CORROSION INHIBITOR WP 1210 ON DRILLING FLUID FRICTION REDUCING AGENTS,**
by B. V. Randall. 12 Feb 65, 8p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to Pan American Petroleum Corp., Tulsa, Okla., rept. nos. F65-P-33, 295-3 (5). Rept. also done for National Science Foundation.

Descriptors: (*Well logging, Feasibility studies), (*Corrosion inhibition, Additives), Water, Sea water, Friction, Fluid flow, Pressure, Pipes, Cutting fluids, Drilling.

Identifiers: Mohole project, Drill pipes.

A study was made to determine what effect, if any, the use of corrosion inhibitors would have on the recommended fluid friction additives in either fresh water or seawater. The corrosion inhibitor selected for testing was Weilmuenster's Inc., WP 1210. The report presented here records the results of this study. The effects of the Weilmuenster corrosion inhibitor were evaluated by pumping tap water, synthetic seawater, and waters containing flax gum, RV-13, and corrosion inhibitor in both the small-scale and large-scale test apparatuses described in the final report on Subcontract 62-02, dated January 13, 1964. The use of WP 1210 in either fresh water or synthetic seawater containing flax meal or Nalco RV-13 decreased the amount of friction reduction obtained an average of three percent in a V-150 drill string. A concentration of 0.2 percent RV-13 reduced friction of seawater about 60 percent without the inhibitor and about 57 percent with inhibitor. Six pounds per barrel of flax meal reduced friction of seawater approximately 47 percent without inhibitor and 44 percent with inhibitor. The conclusion is that addition of Weilmuenster's WP 1210 corrosion inhibitor will not significantly interfere with the friction reducing properties of flax meal or RV-13.

**PB-168 836** **Field 8G**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**THE SELECTION OF THE MOHOLE DRILL SITE,**
by J. D. Sides. Sep 65, 12p
Proj. MOHOLE
Distribution: No limitation. Prepared in cooperation with National Science Foundation, Washington, D. C. Papers on Proj. MOHOLE delivered before the International Upper Mantle Symposia at Ottawa (Canada), 2-11 Sep 65.

Descriptors: (*Well logging, Feasibility studies), (*Site selection, Hawaii), (*Marine geology, Site selection), Drilling, Geophysical prospecting, Economics.

Identifiers: Mohole project.

A site at which it is planned to perform the drilling of the Mohole, to penetrate through the crust of the earth into the mantle, has been tentatively selected. The site is located on the Hawaiian Arch. The selection followed the determination of relevant scientific and technologic criteria. Geophysical investigations were undertaken especially to determine the total depth to mantle at three areas: the Puerto Rico Outer Ridge, the Barracuda Fault area, and the Hawaiian Arch. (Author)

**PB-168 841** **Field 8G, 14B, 13J**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**LOGGING AND MEASUREMENT.**
Staff rept.
Jun 65, 14p
Proj. MOHOLE
Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Instrumentation, Well logging), Control systems, Site selection, Tests, Measurement, Electric cables, Tensiometers, Floating bodies, Electric connectors, Packaging, Design.

Identifiers: MOHOLE project.

**PB-168 842** **Field 8G, 13J, 13H**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**SOME ASPECTS OF PROJECT MOHOLE,**
by W. H. Tonking. Sep 65, 18p
Distribution: No limitation. Papers on Proj. MOHOLE delivered before the International Upper Mantle Symposia at Ottawa (Canada).

Descriptors: (*Well logging, Feasibility studies), Drilling, Drills, Drilling machines, Floating bodies, Control systems, Pipes.

Identifiers: MOHOLE project, Drilling vessels.

**PB-168 843** **Field 8G, 13K**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**WHIP OF DRILL PIPE IN OPEN SEA DRILLING WITH- OUT RISER.**
Staff rept.
Sep 65, 42p
Proj. MOHOLE
Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Drilling), (*Drilling, Pipes), Floats, Oceanographic equipment, Drilling machines, Drills, Flexural strength, Stresses, Marine geology.

Identifiers: MOHOLE project, Risers.

This report is the result of a comprehensive staff study of the problem of lateral deformations caused by local eccentricities of mass along the length of a drill string when the string is rotated. The pattern of standing waves set up on the string depends on the magnitude of the eccentricity and its variation with distance along the string, the speed of rotation of the string, and the damping present in the system. The riser pipe, which can provide lateral constraints on the string, will not be employed during the early stages of drilling when rotary drilling is likely to be used. The study was undertaken with the purpose of taking into account the variation of tension with depth and thus obtaining an estimate of stresses produced by whip of the drill pipe. Appendices give the complete analysis of drill pipe whip, including the assumptions made in deriving the equations. As shown in the report, the maximum bending stress due to whip increases rapidly with speed of rotation and decreases with tension at the bottom of the string. In view of the assumption on the variation of eccentricity along the axis of the drill string, the results do not represent the 'absolute truth.' It is felt, however, that this assumption leads to an upper bound of whip stress produced at a given speed of rotation, given tension at the bottom end and maximum eccentricity. It was concluded that with reasonable precautions, drill pipe whip should not produce intolerable stresses. (Author)

**PB-168 844** **Field 8G, 13K, 20K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**DETAILED SOLUTION TO DYNAMIC STRESS ANALYSIS OF DRILL PIPE.**
Staff rept.
Apr 65, 19p
Proj. MOHOLE
Distribution: No limitation.

Descriptors: (*Well logging, Feasibility studies), (*Stresses, Pipes), (*Pipes, Drilling), Damping, Equations of motion, Partial differential equations.

Identifiers: Mohole project, Drill pipes.

**PB-168 845** **Field 8G, 13K**
**CFSTI Prices: HC$7.00 MF$1.75**
Brown and Root, Inc., Houston, Tex.
**DYNAMIC STRESS ANALYSIS OF THE MOHOLE RISER SYSTEM ADDENDUM.**
Final rept., pt. 2.
Mar 65, 344p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to National Engineering Science Co., Pasadena, Calif., Rept. no. NESCO-SN-183-2A.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Drilling), (*Drilling, Pipes), Floats, Oceanographic equipment, Drilling machines, Flexural strength, Stresses, Hydrodynamics, Marine geology.

Identifiers: MOHOLE project, Risers.

This report pertains to configurations, dynamics, methods of characteristics, buoy configurations and drag, oceanography, and detailed results.

**PB-168 846** **Field 8G, 13K**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT, JANUARY 15 TO MARCH 15, 1965.**
15 Mar 65, 31p
Proj. MOHOLE
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted. Subcontracted to National Engineering Science Co., Pasadena, Calif.

Descriptors: (*Well logging, Feasibility studies), (*Pipes, Drilling), (*Drilling, Pipes), Oceanographic equipment, Drilling machines, Drills, Stresses, Flexural strength, Hydrodynamics.

Identifiers: MOHOLE project, Risers.

The general nature and extent of the work on the Mohole project to be carried out under this new sub-contract has been proceeding on a limited basis and, as a first step, the original assumptions are being rigorously reexamined in an attempt to improve existing computing techniques and to investigate certain aspects of riser and drill pipe stresses previously ignored. The details of these examinations are presented in this report. (Author)

**PB-168 847** **Field 8G, 14B, 13K**
**CFSTI Prices: HC$3.00 MF$0.75**
Brown and Root, Inc., Houston, Tex.
**DRILL PIPE FATIGUE TEST MACHINE, DESCRIPTION AND PROCEDURES FOR MAINTENANCE AND OPERATION.**
31 Aug 65, 65p
Proj. MOHOLE
Distribution: No limitation. Subcontracted to Budd Co., Philadelphia, Pa., rept. nos. 8500-095-1780, EPD-1780.

Descriptors: (*Well logging, Feasibility studies), (*Fatigue (Mechanics), Pipes), (*Test equipment, Fatigue (Mechanics)), Maintenance, Operation, Tensile properties, Design, Drilling.

Identifiers: Mohole project, Drill pipes.

The merits of mechanical vs. hydraulic operation, with respect to the requirements of this specific purpose machine, were explored. The conceptual design, based on a rocker beam for providing the fluctuating load, was considered sound. The design fell within the state of the art of fatigue testing machines, whereas hydraulic systems of the desired capacity would entail considerable development work. The mechanical approach was endorsed. The redesigned test machine resembles the conceptual design in overall appearance. It is somewhat shorter, lighter, and simpler. Loads are better distributed, and ample provision has been made for absorbing recoil energy released when the specimen fractures. The machine is expected to operate for a number of years without major repair or parts replacement.

## 9. ELECTRONICS AND ELECTRICAL ENGINEERING

**AD-296 473** **Field 9B**
**CFSTI Price: MF$2.00**
Stanford Research Inst., Menlo Park, Calif.
**GRAPHICAL DATA PROCESSING RESEARCH STUDY AND EXPERIMENTAL INVESTIGATION.**
Quarterly progress rept. no. 10, 1 Sep-30 Nov 62,
by A. E. Brain, H. S. Crafts, G. E. Forsen, D. J. Hall, and J. W. Machanik. Dec 62, 47p
Contract DA-36-039-sc-78343,
Projs. DA-3A99-22-001-02, SRI-3192
See also AD-289 862. Distribution: No limitation.

Descriptors: (*Data processing systems, Graphics), (*Pattern recognition, Learning machines), Computers, Circuits, Design, Simulation.

Identifiers: MINOS II.

System simulation studies pertinent to the design of MINOS II are summarized. It was determined that majorityrule coding of the binary outputs of a layer of adaptive, threshold-logic units compares favorably, for random input patterns, with maximal-length, shift-register coding, and is simpler to use from a hardware point of view. System and circuitry design requirements and realizations for the preprocessing unit of MINOS II are also described.

**AD-448 747** **Field 9A**
**CFSTI Price: HC$4.00**
Motorola, Inc., Phoenix, Ariz. Semiconductor Products Div.
**THIN FILM TECHNIQUES FOR SILICON INTEGRATED CIRCUITS.**
Final rept. 15 Jun 63-15 Jun 64.
15 Jun 64, 145p
Contract DA-36-039-AMC02342 (E)
Distribution: No limitation.

Descriptors: (*Integrated circuits, Films), Silicon, Substrates, Metal films, Dielectric films, Transistors, Gates (Circuits), Compatibility, Semiconductor devices.

The objective of this program was to investigate the possibility of depositing thin polycrystalline films of metal and dielectric materials on the surface of a silicon integrated circuit in order to form resistive and capacitive elements which would enhance the performance capabilities of integrated circuits. Phase II was concerned with the practical implementation of the key findings of Phase I by fabrication and evaluation of 200 thin film elements and silicon planar transistors on a common silicon substrate. In addition to the 200 thin film samples, 50 final samples of a thin film circuit and ten 3-input gates were required. The compatibility of the thin film process decided upon in Phase I was determined by monitoring certain transistors parameters under specified conditions at various steps in the fabrication process. The 200 thin film samples, the pertinent data, the 50 final samples and the ten 3-input gates have been forwarded to the COTR under separate cover. Discussion of the thin film compatibility study and the conclusion and recommendations evolving from the program are included in this final report. (Author)

**AD-460 324** **Field 9E**
**CFSTI Price: HC$1.00**
Army Missile Command, Redstone Arsenal, Ala. Instrumentation Branch.
**FREQUENCY RESPONSE, NOISE, AND PULSE TRANSMISSION IN AN FM/FM TELEMETRY SYSTEM,**
by C. F. Asquith. 1 Feb 65, 24p RG-TR-65-3
Proj. DA-1B242403D231
Distribution: No limitation.

Descriptors: (*Telemeter systems, Frequency modulation), Telemetering data, Noise (Radio), Wave transmission, Low-pass filters, Bandwidth, Electromagneticpulses.

This report presents some experimental data taken in a study of a standard FM/FM telemetry system. The objective of the continuing study program is to assign each onboard missile measurement to an optimum telemetry channel. Taken into account are noise to be tolerated and frequency response characteristics, assuming a reasonable estimate of signal behavior. Pulses and repetitive waveforms are used to determine transmission capability. (Author)

**AD-465 367** **Field 9B**
**CFSTI Prices: HC$1.00 MF$0.50**
Navy Electronics Lab., San Diego, Calif.
**MODIFICATION OF THIRD-OCTAVE DIGITAL ANALYZER (TODA).**
Research and development rept. for Jun-Nov 64,
by R. E. Cruse. 10 May 65, 24p Rept. no. NEL-1286
Proj. SF-001-03-15,
Tasks 8119, NEL-L20451
Distribution: No limitation.

Descriptors: (*Spectrum analyzers, Digital systems), (*Analog-digital computers, Spec-

trum analyzers), (*Digital computers, Spectrum analyzers), Analog-todigital converters, Data processing systems, Computer logic, Experimental design.

Identifiers: TODA.

The Third-Octave Digital Analyzer (TODA) is a 40channel spectrum analyzer which has been in operation at the Navy Electronics Laboratory since 1956. The analog portion of the TODA consists of 38 third-octave band filters with attendant amplifiers and equalizers covering the frequency range from 9 to 56,000 c/s. Operational experience with the TODA indicated the need for a reduction of failures and increased ease of maintenance. This experience had shown that the majority of the TODA down time was due to failures of components in the digital portion. In addition, the editing and correction of output data, produced on punched tape, was tedious and timeconsuming. To correct these shortcomings, the digital portion of the TODA has been redesigned, with major emphasis given to the reduction of down time through the use of components which are inherently more reliable and which can easily be replaced in the event of failure.

**AD-465 805** **Field 9B**
**CFSTI Price: HC$4.00**
Ballistic Research Labs., Aberdeen Proving Ground, Md.
**THE FORAST PROGRAMMING LANGUAGE FOR ORDVAC AND BRLESC (REVISED),**
by Lloyd W. Campbell and Glenn A. Beck. Mar 65, 144p BRL-1273, BRL-1172 superseded
Proj. RDT/E-1P014501A14B
Distribution: No limitation.

Descriptors: (*Programming languages, Digital computers), Compilers, Vocabulary, Digital systems, Arithematic, Special purpose computers, Ordnance laboratories.

Identifiers: FORAST programming language, ORDVAC computer, BRLESC computer.

FORAST is a procedure oriented programming language designed for use on the ORDVAC and BRLESC computers at BRL. Although it was designed for professional programmers, FORAST contains sufficient simple concepts to make it usable by a novice or journeyman. It permits the use of arithmetic formulas, some English word statements, and each computer accepts its own symbolic or absolute machine language. The latter feature permits the professional programmer to use the full power of each computer. (Author)

**AD-465 856** **Field 9B**
**CFSTI Prices: HC$1.00 MF$0.50**
Navy Electronics Lab., San Diego, Calif.
**AUTOMATIC DATA SEQUENCER. A MODIFICATION TO THE DIGITAL DATA INTRODUCER (KEYSET) MX-3195 (V)/USQ-20 (V), FOR EASIER AND FASTER DATA ENTRY,**
by L. R. Harrold. 7 May 65, 19p NEL-1287
Proj. SS-316-001,
Task 9275 (NEL-G20551)
Distribution: No limitation.

Descriptors: (*Data processing systems, Radar signals), (*Input-output devices, Switching circuits), Automatic, Electromagnetic warfare, Digital systems, Programming (Computers), Binary arithmetic, Computer logic.

The Digital Data Introducer, MX-3195 (V)/USQ-20 (V), was modified by solid-state circuitry to enable the operator to enter data faster and easier than with an unmodified keyset. The modification has been installed in two ECM keysets and tested successfully in simulated ECM exercises. The circuitry is universally applicable for all keyset display formats. (Author)

**BNL-9355** **Field 9B, 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**ACTIVITY REPORT ON BROOKHAVEN WORK ON THE COMPILATION, STORAGE AND EVALUATION OF NUCLEAR CROSS SECTION DATA,**
by Jack Chernick. May 65, 19p CONF-650524-3
Contract CONF-650524-3
Prepared for presentation at European Nuclear Energy Agency and Atomic Energy Commission Seminar, Upton, N. Y. Distribution: No limitation.

Descriptors: (*Nuclear cross sections, Nuclear energy), (*Computers, Nuclear cross sections).

**BNWL-SA-171** **Field 9B, 18I**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**COMPUTER APPLICATIONS IN SIMULATION,**
by G. G. Thieme. 26 Apr 65, 18p
Contract AT (45-1)-1830
Distribution: No limitation.

Descriptors: (*Analog computers, Simulation), (*Computers, Simulation).

**C13.10:266** **Field 9B**
**CFSTI Price: MF$2.25**
National Bureau of Standards, Washington, D. C.
**COMPUTER LITERATURE BIBLIOGRAPHY, 1946 TO 1963,**
by W. W. Youden. 31 Mar 65, 471p NBS-Misc-Publ-260-5
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $3.75.

Descriptors: (*Computers, Bibliographies), Scientific research, Information retrieval, Indexes.

Identifiers: KWIC index.

Over 6,100 references are contained in this bibliography of computer literature published during the years 1946 through 1963. The Bibliography Section includes the full title and all of the authors of every article published in 9 journals, 21 books, and over 100 proceedings. No articles from other sources are included. The books selected are those that have chapters by individual authors, as such chapters are not normally indexed in most libraries. The Title Word Index Section is used to find an article if any part of its title is known or to find all the articles whose titles include a particular word or phrase. The Author Index Section lists all authors of each article, but does not indicate whether an individual is the sole author of the article. The bibliography is intended not only to serve those in the computer field, but also to be an experiment in information retrieval to determine the value of cumulative KWIC and author indexes to published literature in a specific subject area. (Author)

**C13.46:222** **Field 9F, 22B, 4A**
**CFSTI Price: MF$0.50**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**A MINIMUM TELEMETRY RECEIVING SYSTEM FOR THE ALOUETTE TOPSIDE SOUNDER SATELLITE.**
Technical note,
by Earl E. Ferguson and Richard G. Green. 9 Oct 64, 28p NBS-TN-222
N65 15320
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.30.

Descriptors: (*Telemeter systems, Scientific satellites), (*Scientific satellites, Atmospheric sounding), (*Atmosphere sounding, Telemeter systems), Data transmission systems, Radio equipment.

Identifiers: Alouette.

**C13.46:265** **Field 9A**
**CFSTI Prices: HC$0.50 MF$0.75**
National Bureau of Standards, Washington, D. C.
**TABULATION OF PUBLISHED DATA ON SOVIET ELECTRON DEVICES THROUGH JUNE 1965.**
Technical note,
by Charles P. Marsden. 1 Oct 65, 88p NBS-TN-265, NSB-TN-186 superseded
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50.

Descriptors: (*Electron tubes, USSR), (*Semiconductor devices, USSR), Lists, Diodes (Semiconductor), Thermistors, Transistors.

This tabulation includes published data on Soviet electron devices as collected from publications, mostly handbooks published by the various ministries and institutes of the USSR. Information is given on all active devices ranging from receiving to microwave devices, semiconductor devices, and miscellaneous devices such as, for example, photographic flash tubes and thermistors. (Author)

**C13.46-264** **Field 9B, 5B, 7**
**CFSTI Price: MF$0.75**
National Bureau of Standards, Washington, D. C. Inst. for Applied Technology.
**HAYSTAQ: A MECHANIZED SYSTEM FOR SEARCHING CHEMICAL INFORMATION.**
Technical note,
by Ethel C. Marden. 27 Sep 65, 63p
NBS TN-264
74 Hard copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.50.

Descriptors: (*Chemistry, Information retrieval), (*Information retrieval, Chemistry), (*Patents, Chemistry), Automatic, Atoms, Chemical bonds, Algorithms, Chemical compounds, Organic compounds, Programming (Computers), Topology.

Identifiers: United States Patent Office, HAYSTAQ (Chemical information search).

HAYSTAQ is a comprehensive computer system for searching chemical information and is particularly directed toward the stringent requirements of the U. S. Patent Office. The greatest activity to date has been in the design of a satisfactory method to search for chemical structures. A structure diagram is considered as a network, where the atoms or functional groups are the nodes and the bonds between them the links. The search algorithm consists of attempting to match, via a topological tracing, a question network (structure) against each structure in the file of chemical compounds stored on magnetic tape. The structure search includes provision for Markush structures and other generic concepts. Each of 385 questions was matched against a file of 2,400 entries containing (because of the Markush feature) effectively 162,000 compounds. The continuation of this work includes the use of the Hayward linear notation as input and extension of the search routines to other kinds of information associated with chemical structures. (Author)

**CONF-650621-1** **Field 9B**
**CFSTI Prices: HC$1.00 MF$0.50**
Knolls Atomic Power Lab., Schenectady, N. Y.
**USE OF BULK CORE MEMORY IN IMPROVING TIME SHARING EFFICIENCY,**
by H. D. Reilly, Jr. 1964, 7p
Contract W-31-109-eng-52
Presented at Special Technical Meeting on Use of Remote Access, Time Sharing Computer Systems, Schenectady, N. Y. Distribution: No limitation.

Descriptors: (*Computers, Scheduling), (*Computer logic, Scheduling).

COO-614-23 Field 9B
CFSTI Prices: HC$4.00 MF$1.00
Chicago Univ., Ill. Inst. For Computer Research.
ICR QUARTERLY REPORT NUMBER 3,
by Nicholas C. Metropolis. 1 Nov 64, 169p
Contract AT (11-1)-614
Distribution: No limitation.

Descriptors: (*Computers, Scientific research).

N65-16418 Field 9C
CFSTI Prices: HC$5.00 MF$1.00
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
DETERMINATION OF ELECTRICAL CONDUCTIVITY OF MATING SURFACES - A LITERATURE SURVEY,
Final rept.,
by W. E. Woolf. Dec 63, 163p
Contract NAS8-5292
NASA CR-60526
Distribution: No limitation.

Descriptors: (*Metal joints, Electrical conductance), (*Electrical conductance, Metal joints).

N65-16479 Field 9E
CFSTI Prices: HC$5.00 MF$1.00
Illinois Univ., Urbana. Dept. of Electrical Engineering.
THE IMPEDANCE OF A SHORT DIPOLE ANTENNA IN A MAGNETOPLASMA,
by K. Balmain. May 63, 171p
Grant NSG-395
NASA CR-50496
Distribution: No limitation.

Descriptors: (*Dipole antennas, Electrical impedance).

N65-17221 Field 9A
CFSTI Prices: HC$2.00 MF$0.50
CBS Labs., Stamford, Conn. Electron Tube Dept.
1-1/2 INCH RUGGED IMAGE DISSECTOR TUBE.
Final rept. for 25 Feb-18 Sep 64,
by S. Juchnowycz. 12 Oct 64, 39p
Contracts NAS7 100, JPL950848
NASA CR-60747
Distribution: No limitation.

Descriptors: (*Image tubes, Reliability (Electronics)).

N65-17512 Field 9E
CFSTI Prices: HC$2.00 MF$0.50
Westinghouse Electric Corp., Baltimore, Md. Molecular Electronics Div.
DEVELOPMENT AND FABRICATION OF A MOLECULAR ELECTRONICS PREAMPLIFIER.
Summary rept.,
by P. Greiff. 21 Dec 64, 28p
Contract NAS8 5455
NASA CR-60856
Distribution: No limitation.

Descriptors: (*Preamplifiers, Molecular electronics).

N65-17884 Field 9C
CFSTI Prices: HC$3.00 MF$0.50
Harry Diamond Labs., Washington, D. C.
RADIATION-RESISTANT ELECTRONICS.
Final progress rept., 1 Jan-30 Sep 64,
by C. H. Klute, O. L. Meyer, H. Morris, andJ. L. Scales, III. 1963, 52p HDL-PR-64-1
Contract NASW-251
NASA CR-60938
Distribution: No limitation.

Descriptors: (*Electronics, Radiation damage).

N65-17954 Field 9C, 18H
CFSTI Prices: HC$1.00 MF$0.50
Battelle Memorial Inst., Columbus, Ohio.
A STUDY OF THE RELIABILITY OF ELECTRONIC COMPONENTS IN A NUCLEAR-RADIATION ENVIRONMENT.
Quarterly rept. no. 7, 1 Jul-30 Sep 64,
by D. J. Hamman and C. L. Hanks. 13 Oct 64, 10p
Contracts NAS7-100, JPL-950458
NASA CR-60983
Distribution: No limitation.

Descriptors: (*Reliability (Electronics), Radiation damage), (*Radiation damage, Electronic equipment).

N65-18249 Field 9A
CFSTI Prices: HC$3.00 MF$0.75
Westinghouse Electric Corp., Pittsburgh, Pa.
A STUDY ON THE DETERMINATION OF MANUFACTURING PROBLEMS SIGNIFICANTLY AFFECTING RELIABILITY OF SILICON PLANAR DEVICES.
Final summary rept. for Jul-Dec 64,
by M. W. Larkin and M. J. Geisler. Dec 64, 61p
Contract NAS8 11382
NASA CR-57112
Distribution: No limitation.

Descriptors: (*Transistors, Manufacturing methods), (*Integrated circuits, Manufacturing methods).

N65-18250 Field 9A
CFSTI Prices: HC$2.00 MF$0.50
Lockheed-Georgia Co., Marietta. Georgia Nuclear Labs.
COMPONENTS IRRADIATION TEST NO. 7, 2N834 TRANSISTORS, 1N540 AND 1N649 DIODES, SIN752A ZENER DIODES.
28 Sep 64, 50p Rept. no. ER-7620
Contract NAS8 5332
NASA CR-57107
Distribution: No limitation.

Descriptors: (*Transistors, Radiation damage), (*Diodes (Semiconductor), Radiation damage), (*Radiation damage, Semiconductor devices).

N65-18945 Field 9E
CFSTI Prices: HC$2.00 MF$0.50
Harvard Univ., Cambridge, Mass. Gordon McKay Lab.
THE RESISTIVELY-LOADED ANTENNA CURRENT DISTRIBUTION IMPEDENCE AND TERMINAL-ZONE CORRECTION RADIATION FIELD.
Scientific rept.,
by Bob M. Duff. Oct 64, 27p Rept. no. SR-3
Grant NsG579
NASA CR-57182
Distribution: No limitation.

Descriptors: (*Antennas, Electric currents), (*Electrical impedance, Antennas).

N65-18948 Field 9E, 9A
CFSTI Prices: HC$2.00 MF$0.50
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
NONDISSIPATIVE DC TO DC REGULATOR-CONVERTER STUDY.
Quarterly rept. no. 1, 15 Jun-15 Sep 64,
by R. Donner. 15 Sep 64, 48p Rept. no. HSER-3037
Contract NAS5 3921
NASA CR-57174
Distribution: No limitation.

Descriptors: (*Rectifiers, Modules (Electronic)), (*Modules (Electronic), Rectifiers).

N65-19880 Field 9E
CFSTI Prices: HC$3.00 MF$0.75
Electronics Research Lab., Montana State Coll., Bozeman.
FM DEMODULATOR THRESHOLD REDUCTION.
Final rept.,
by John Duncan. Sep 64, 87p Rept. no. ERL-8-009-623
Contract NAS5 3616
NASA CR-57496
Microfilmed from best available copy. Distribution: No limitation.

Descriptors: (*Frequency modulation, Demodulators), (*Demodulators, Frequency modulation).

N65-20757 Field 9F, 22B
CFSTI Prices: HC$3.00 MF$0.75
Goodyear Aerospace Corp., Akron, Ohio.
HIGH-GAIN SPACECRAFT ANTENNA DESIGN AND DEVELOPMENT.
Final rept.,
by J. W. Haylett. Apr 64, 96p GER-11156
Contracts NAS7-100, JPL-950467
NASA CR-57742
Distribution: No limitation.

Descriptors: (*Satellite antennas, Experimental design), (*Antennas, Spacecraft).

N65-21763 Field 9A
CFSTI Prices: HC$2.00 MF$0.50
Electro-Mechanical Research, Inc., Princeton, N. J.
INVESTIGATION OF DARK CURRENT IN ASCOP S41F MULTIPLIER PHOTOTUBES AFTER EXPOSURE TO HIGH LIGHT LEVEL.
Final rept. for 23 Oct-23 Dec 64.
23 Dec 64, 33p
Contract NAS5 9089
NASA CR-62242
Distribution: No limitation.

Descriptors: (*Phototubes, Light).

N65-22130 Field 9A, 3A
CFSTI Prices: HC$5.00 MF$1.00
Westinghouse Electric Corp., Baltimore, Md. Electronic Tube Div.
STUDY OF THE DESIGN PROBLEMS OF AN INTEGRATING TELEVISION TUBE FOR ASTRONOMICAL RESEARCH.
Final rept.
Dec 64, 165p
Grant NsG414
NASA CR-62303
Distribution: No limitation.

Descriptors: (*Cathode ray tubes, Design), (*Astronomy, Cathode ray tubes).

N65-22169 Field 9A, 9B, 12A
CFSTI Prices: HC$6.00 MF$1.25
General Electric Co., Cincinnati, Ohio.
COMPUTER SOLUTIONS OF THE VLASOV EQUATIONS,
Final rept., 1 Jun 63-30 Nov 64,
by D. C. Prince, Jr., and N. P. Jefferies. 30 Dec 64, 255p
Contract NAS8 5214
NASA CR-62344
Distribution: No limitation.

Descriptors: (*Diodes, Programming (Computers)), (*Geometric forms, Diodes), (*Plasma physics, Diodes), (*Equations, Programming (Computers)).

**N65-22172** **Field 9C**
**CFSTI Prices: HC$3.00 MF$0.50**
Honeywell, Inc., Hopkins, Minn. Ordnance Div.
**LOW VOLTAGE DC TO DC CONVERTER-REGULATOR WITH MINIMUM EXTERNAL MAGNETIC FIELD DISTURBANCE.**
Quarterly progress rept. no. 1, 1 Jun-30 Aug 64, by John T. Lingle and Kenneth Johnson. 30 Aug 64, 56p
Contract NAS5 3899
NASA CR-62352
Distribution: No limitation.

Descriptors: (*Current regulators, Direct current), (*Electrical equipment, Direct current).

**N65-23192** **Field 9A**
**CFSTI Prices: HC$2.00 MF$0.50**
Microwave Electronics Corp., Palo Alto, Calif.
**INVESTIGATION OF SOLID STATE TRAVELING-WAVE AMPLIFIER TECHNIQUES FOR FUTURE SATELLITE APPLICATIONS.**
Quarterly progress rept., No. 2, 1 Oct-31 Dec 64. Jan 65, 33p
Contract NAS5-3972
NASA CR-62527
Distribution: No limitation.

Descriptors: (*Traveling-wave tubes, Satellites (Artificial)).

**N65-23694** **Field 9B**
**CFSTI Prices: HC$0.75 MF$0.50**
National Aeronautics and Space Administration. Cleveland Ohio. Lewis Research Center.
**MICROPOWER LOGIC CIRCUITS,**
by John C. Sturman. May 65, 21p
NASA SP-5022
Distribution: No limitation.

Descriptors: (*Computer logic, Digital systems), (*Spacecraft, Computer logic).

**N65-24722** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Antenna Lab., Ohio State Univ. Research Foundation, Columbus.
**RECEIVER TECHNIQUES AND DETECTORS FOR USE AT MILLIMETER AND SUBMILLIMETER WAVELENGTHS.**
Semi-annual rept. for 1 Sep 64-28 Feb 65. 28 Feb 65, 12p Rept. no. 1093-26
Grant NsG74 60
NASA CR-62881
Distribution: No limitation.

Descriptors: (*Millimeter waves, Radio receivers), (*Submillimeter waves, Radio receivers), (*Radio equipment, Millimeter waves).

**N65-24992** **Field 9A, 20L**
**CFSTI Prices: HC$5.00 MF$1.00**
Stanford Univ., Calif. Stanford Electronics Labs.
**RESEARCH REVIEW.**
Quarterly research review no. 11, 1 Oct-31 Dec 64,
by W. R. Ramo. 1965, 172p Rept. no. SU-SEL-133
Contracts AT04 3 1326, SD87 003
NASA CR-63088
Distribution: No limitation.

Descriptors: (*Electronic equipment, Scientific research), (*Solid-state physics, Scientific research).

**N65-33359** **Field 9A**
**CFSTI Prices: HC$3.00 MF$0.75**
Varian Associates Palo Alto, Calif.
**RESEARCH ON AN ELECTROSTATICALLY FOCUSED KLYSTRON,**
by D. G. Dow and R. J. Butwell. Sep 65, 75p
Contract NAS1 3972
NASA CR-300
Distribution: No limitation.

Descriptors: (*Klystrons, Electrostatic fields), (*Electrostatic fields, Focusing).

**N65-33544** **Field 9E, 17B**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration. Moffett Field, Calif. Ames Research Center.
**A DEMODULATION SYSTEM FOR VECTOR MEASUREMENTS FROM A SPINNING SATELLITE,**
by William J. Kerwin and Robert Munoz. Sep 65, 14p
NASA TND-2310
Distribution: No limitation.

Descriptors: (*Demodulation, Radio signals), (*Satellites (Artificial), Data).

**N65-34242** **Field 9E**
**CFSTI Prices: HC$2.00 MF$0.50**
Goddard Space Flight Center, Greenbelt, Md.
**BANDWIDTH OPTIMIZATION FOR FREQUENCY SHIFT KEYING,**
by James C. Morakis. Sep 65, 41p
NASA TN-D-3000
Distribution: No limitation.

Descriptors: (*Frequency shift keyers, Bandwidth).

**Patent 3,215,956** **Field 9E, 17I**
**WAVEGUIDE MIXER FOR RADAR SYSTEM.**
Patent assigned to Navy,
by Frank E. Hasseld, Jr. and Charles W. May. 2 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Mixers (Electronic), Waveguides), (*Radar antennas, Mixers (Electronic)), Monopulse radar, Waveguide couplers, Radar tracking, Azimuth, Radar duplexers, Magnetrons, Patents.

The waveguide mixer is for use in a four-lobe, monopulse, tracking radar. The base portion of the assembly has a central channel and four channel arms connecting the central channel. Each channel arm has a short waveguide channel adjacent to it that is separated from the channel arm by a very thin wall that has a portion removed to provide an opening into the waveguide channel. The central channel has a waveguide opening through which is transmitted microwave energy from a local oscillator. Each short waveguide channel has an opening at one end through which microwave energy is transmitted and this energy is coupled with the local oscillator energy. The cover portion of the mixer assembly is provided with crystal probes which extend into the various channel arms of the base portion.

**Patent 3,217,180** **Field 9A, 9B**
**OUTPUT-FOLLOWS-INPUT PULSE AMPLIFIER EMPLOYING A TUNNEL DIODE BISTABLE CIRCUIT HAVING AN INDUCTOR.**
Patent assigned to Navy,
by Richard H. Bergman. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Pulse amplifiers, Computers), (*Tunnel diodes, Pulse amplifiers), Patents.

The fast pulse amplifier is for use as a computer component. Computers built of such components are free from the necessity of using expensive timing pulse circuitry. Two tunnel diodes are connected in series and form the main components of the circuitry.

**Patent 3,217,187** **Field 9A, 9B**
**INVERTER CIRCUIT.**
Patent assigned to Air Force,
by Arden J. Wolterman. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Inverter circuits, Computer logic), Digital computers, Patents.

The inverter circuit has utility in logic circuits for very high speed digital computers performing up to a billion bit rate (1000-me. clock machine). The circuit is compatible with Goto logic circuits. The inverter circuit enables a Goto twin node to attain a voltage level equal to that of other computer circuits.

**Patent 3,217,247** **Field 9C**
**SYSTEM FOR MEASUREMENT OF ATTENUATION TAKEN DIRECTLY IN DECIBELS AT RADIO FREQUENCIES UTILIZING LOGARITHMIC CIRCUITS.**
Patent assigned to Air Force,
by Robert N. Taber. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Attenuation, Test methods), (*Test equipment (Electronics), Attenuators), Patents, Radiofrequency pulses, Signals, Power dividers, Demodulators, Circuits, Amplifiers.

The system is comprised of a radio frequency pulse source which supplies a testing signal to a power divider. Each of two equal outputs of the power divider is respectively applied to an attenuator under test and a standard calibrated attenuator. The attenuated signals from the two attenuators are each applied to an associated logarithmic circuit. The logarithmic circuit detects each signal applied thereto and converts the detected linear signal to a logarithmic signal. The difference between these logarithmic signals is computed in a difference amplifier and applied to an indicator.

**Patent 3,218,578** **Field 9E**
**CARRIER SUPPRESSED AMPLITUDE MODULATION SYSTEM UTILIZING FREQUENCY MODULATION AND J SUB O - ORDER BAND-PASS FILTER.**
Patent assigned to Air Force,
by Ralph W. Mifflin. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Signals, Amplitude modulation), (*Amplitude modulation, Electromagnetic waves), Patents, Modulators, Frequency modulation, Band-pass filters, Oscillators.

The system is for the production of an amplitude modulated wave. The modulation may represent voice signals, musical passages, and the like. The input is received from a microphone through an amplitude modulator which is fed a sub-carrier signal from an oscillator. The system further includes a reactance tube modulator, a second oscillator, a bandpass oscillator, a bandpass filter and an output.

**Patent 3,218,581** **Field 9E**
**MICROWAVE ENERGY COUPLER.**
Patent assigned to Army,
by Robert F. Fischer and Donald A. Soorian. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Waveguide couplers, Microwave equipment), Patents, Attenuation, Effectiveness.

The waveguide electromagnetic energy couplers are utilized between ultra-high-frequency transmission lines. The directional coupler has a high directivity that is essentially independent of frequency, thus greatly increasing its utility. The convenient mechanical arrangement of the wave guide sections permits conventional wave guide coupling to either end of the auxiliary guide without the use of elbows, and the arrangement further presents a compact coupler which may be easily handled.

**Patent 3,218,585** **Field 9A**
**STRIPLINE BOARD CONNECTOR.**
Patent assigned to Navy,
by Charles B. May. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Transmission lines, Circuit interconnections), (*Electric connectors, Transmission lines), Microwave equipment, Standing wave ratios, Sandwich construction, Waveguide couplers, Patents, Radiofrequency.

Identifiers: Stripline circuits.

The radio frequency connectors are suitable for mechanically and electrically joining stripline boards. The body member has an electrically conductive shell including two outer cylindrical portions extending from a flange portion, a channel of rectangular cross section extending trhough the shell and terminating in a pair of windows in the cylindrical surfaces of the outer portions, the channel being filled with dielectric material and a strip conductor being centered therein and terminating in tabs extending beyond the windows, and the shell being formed as two separable complementary parts to facilitate manufacture and assembly.

**Patent 3,218,643** **Field 9E**
**DOUBLE-REFLECTOR ANTENNA WITH CRITICAL DIMENSIONING TO ACHIEVE MINIMUM APERTURE BLOCKING.**
Patent assigned to Army,
by Peter W. Hannan and Harold A.
Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Antenna configurations, Reflectors), Patents, Antenna aperture, Polarization, Antenna feeds.

The double-reflector antenna with minimum aperture blocking includes a main reflector and subreflector cooperating with the main reflector for reflecting a wave incident in an area having an equivalent diameter substantially equal to the square root of twice the product of the operating wave length times the focal length of the main reflector.

**PB-168 582** **Field 9E**
**CFSTI Prices: HC$1.00 MF$0.50**
SSCO Standards Lab., Inc., Southfield, Mich.
**TWO PHASE OSCILLATOR MODEL 1443 (COMMUNICATION MEASUREMENTS LABORATORY, INC.).**
Technical manual instrument calibration procedure AG-77.
15 Jun 65, 13p
Contract N123 (62861)35059A
NAVWEPS 17-20AG-77
Distribution: No limitation.

Descriptors: (*Oscillators, Calibration), Instruction manuals, Test methods, Test equipment (Electronics).

The manual describes the calibration procedure for the Communication Measurements Laboratory, Inc. Model 1443, Two Phase Oscillator. The Oscillator covers the frequency range of from 17 to 6000 cps in five bands, and delivers a two phase signal with a displacement of 90 degrees.

**PB-168 584** **Field 9C**
**CFSTI Prices: HC$2.00 MF$0.50**
Burroughs Corp., Radnor, Pa.
**TRANSMISSION MEASURING SET TS-559A/FT, TS-559/FT AND NOISE MEASURING SET MODEL 28 (WESTERN ELECTRIC CO.).**
Technical manual instrument calibration procedure AX-04.
15 Jun 65, 32p
Contract N123 (62861)35057A
NAVWEPS 17-20AX-04
Distribution: No limitation.

Descriptors: (*Noise (Radio), Measuring devices (Electrical ; Electronic)), (*Measuring devices (Electrical ; Electronic), Calibration), Telephone equipment, Voltage, Transmission lines, Measurement, Portable, Instruction manuals, Test methods.

The manual contains the information necessary for calibrating the TS-559/FT Transmission Measuring Set, the TS-559A/FT Transmission Measuring Set, or the Western Electric Company Model 2B Noise Measuring Set. The instrument being calibrated is herein referred to as the Test Instrument. This portable instrument, which is designed to measure, and visually indicate noise voltages in telephone circuits, can also be used to make transmission line measurements. By its use, noise magnitudes of 10 to 85 decibels below reference level at frequencies up to 10,000 cps can be measured. In addition, the Test Instrument can be used as a flat amplifier or as an oscillator. Six 22.5-volt batteries and two 1.5-volt batteries are required for operation of the Test Instrument.

**PB-168 600** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**AUDIO FREQUENCY CODERS KY-430/SRM AND KY-431/SRM.**
Handbook instrument calibration procedures.
1 Aug 65, 16p NAVWEPS-17-20BCK-6
Distribution: No limitation.

Descriptors: (*Command ; control systems, Test sets), (*Test sets, Calibration), Target drones, Codings, Signals, Audiofrequency, Instruction manuals, Test methods.

The manual describes the calibration procedure for Audio Frequency Coder KY-430/SRM and KY-431/SRM.

**PB-168 601** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**RADIO TRANSFER TEST SET TS-1749/SRM-2.**
Handbook instrument calibration procedures.
1 Aug 65, 8p NAVWEPS-17-20BCK-1
Distribution: No limitation.

Descriptors: (*Radio equipment, Switching circuits), (*Switching circuits, Test sets), (*Test sets, Calibration), Transfer switches, Instruction manuals, Test methods, Test equipment (Electronics).

The manual describes the calibration procedure for Radio Set Transfer Control Test Set TS-1749/SRM-2. The TS-1749/SRM-2 tests the switching circuits of Radio Set Transfer Control C-3307/UR, which is a part of Power Supply PP-2658/UR, by comparing the transfer control switching circuits with standard switching circuits in the Test Instrument. Controls and indicators are provided for selecting the desired level of the simulated power signals that are applied to the C-3307/UR, and for displaying the resulting conditions of transfer control operation.

**PB-168 611** **Field 9C, 17B, 6D, 20I**
**CFSTI Prices: HC$6.00 MF$1.50**
Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
**QUARTERLY PROGRESS REPORT NO. 60 FOR PERIOD ENDING NOVEMBER 30, 1960,**
by J. B. Wiesner, G. G. Harvey and H. J. Zimmermann. 15 Jan 61, 266p
Contract DA-36-039-sc-78108,
Proj. DA-3-99-00-000,
Task DA-3-99-20-001
AD 253 561
Distribution: No limitation.

Descriptors: (*Physics, Scientific research), (*Electronics, Scientific research), (*Plasma physics, Scientific research), (*Solid state physics, Scientific research), Low-temperature research, Thermodynamics, Microwave spectroscopy, Nuclear magnetic resonance, Microwaves, Molecular beams, Thermoelectricity, Stroboscopes, Modulation, Information theory, Data processing systems, Computers, Data transmission systems, Programming (Computers), Acoustics, Speech transmission, Biophysics, Machine translation, Electrical networks, Neurology, Physiology.

Contents: Physical electronics; Plasma dynamics; Solid state physics; Low temperature physics; Statistical thermodynamics; Microwave spectroscopy; Nuclear magnetic resonance and hyperfine structure; Microwave electronics; Molecular beams; Stroboscopic research; Modulation theory and systems; Statistical communication theory; Thermoelectric processes and materials; Process analysis and synthesis; Processing and transmission of information; Artificial intelligence; Physical acoustics; Speech communications; Signal detection by human observers; Mechanical translation; Linguistics; Communications biophysics; Neurophysiology; Neurology; Circuit theory and design; Noise in electron devices; Network synthesis; Sensory aids research; Computer study of the dynamics of a national economy; Computer components and systems.

**PB-168 615** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**RECEIVER TEST SET TS-1751/SRM-2.**
Handbook instrument calibration procedures.
1 Aug 65, 9p NAVWEPS-17-20BCK-2
Distribution: No limitation.

Descriptors: (*Radio receivers, Test sets), (*Test sets, Calibration), Instruction manuals, Test methods, Test equipment (Electronics).

The manual describes the calibration procedure for Receiver Test Set TS-1751/SRM-2. The TS-1751/SRM-2, tests and calibrates various subassemblies, circuits, and components of Radio Receiver R-999/URM-16. The power, controls, dummy loads, indicators, and meters required to completely test the radio receiver are provided by the Test Instrument.

**PB-168 658** **Field 9A**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**FIXED COAXIAL ATTENUATORS, 0 TO 50DB, 0.2 TO 10.0 GHz.**
Technical manual instruement calibration procedure, GA-05.
1 Jul 65, 22p NAVWEPS-17-20GA-05
Distribution: No limitation.

Descriptors: (*Coaxial cables, Attenuators), (*Attenuators, Calibration), Instruction manuals, Test methods.

The manual describes the calibration procedure for fixed coaxial attenuators of values between 0 and 50 db and at frequencies of 0.2 to 10.0 GHz.

**PB-168 659** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**MILLIOHMMETER MODEL 657 (SIMPSON ELECTRIC COMPANY).**
Technical manual instrument calibration procedure AR-16.
15 Jul 65, 11p
Contract N123 (62861)51294A
NAVWEPS 17-20AR-16
Distribution: No limitation.

Descriptors: (*Ohmmeters, Calibration), (*Test equipment (Electronics), Ohmmeters), Instruction manuals, Test methods, Measuring devices (Electrical 2 electronic).

The manual describes the calibration procedure for the Simpson Model 657 Milliohmmeter. The Test Instrument is an accessory item of the Simpson Model 260 and 270 Volt-Ohm-Milliammeters, which permits measurement of low resistance values.

**PB-168 660** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Burroughs Corp., Radnor, Pa.
**RMS VOLTMETER MODEL 3400A.**

Technical manual instrument calibration procedure AE-42.
15 Jun 65, 24p
Contract N123 (62861)35057A
NAVWEPS 17-20AE-42
Distribution: No limitation.

Descriptors: (*Voltmeters, Calibration), (*Test equipment (Electronics), Voltmeters), Instruction manuals, Test methods, Measuring devices (Electrical ; Electronic).

The manual contains the information necessary for calibrating the Hewlett-Packard 3400A RMS Voltmeter. This portable instrument provides a means of measuring the actual root mean square (rms) value of ac voltages between 1 mv and 300 v rms with a frequency response of 10 cps to 10 mc. Nonsinusoidal waveforms with a ratio of peak voltage to rms (crest factor) as high as 100 can be accurately measured with the Test Instrument.

**PB-168 661** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**VOLTAGE DIVIDER TS-89/AP SERIES TS-89A/AP TS-89B/AP - TS-89C/AP.**
Technical manual instrument calibration procedure AN-08.
15 Jul 65, 11p
Contract N123 (62861)35056A
NAVWEPS 17-20AN-08
Distribution: No limitation.

Descriptors: (*Voltage dividers, Calibration), Video signals, Measurement, Oscilloscopes, Instruction manuals, Test methods, Electronic equipment.

The manual describes the calibration procedure for the TS-89A/AP, TS-89B/AP, and TS-89C/AP Voltage Dividers. The Test Instrument is a portable, self contained unit designed for use in conjunction with an oscilloscope to measure video pulses between 200 and 20,000 volts in high impedance circuits.

**PB-168 662** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**Z-Y BRIDGE 1603-A (GENERAL RADIO).**
Technical manual instrument calibration procedure AZ-18.
1 Jul 65, 18p
Contract N123 (62861)35056A
NAVWEPS 17-20AZ-18
Distribution: No limitation.

Descriptors: (*Impedance bridges, Calibration), Admittance, Measurement, Instruction manuals, Test methods, Measuring devices (Electrical + Electronic).

The manual describes the calibration procedure for the General Radio 1603-A Z-Y Bridge, which is capable of measuring impedance and admittance over a frequency range of 20 cps to 20 kc.

**PB-168 663** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**SPECTRUM ANALYZER AN/UPM-17.**
Technical manual instrument calibration procedure GW-03.
15 Jul 65, 20p
Contract N123 (62861)35056A
NAVWEPS 17-20GW-03
Distribution: No limitation.

Descriptors: (*Radiofrequency spectroscopy, Spectrum analyzers), (*Spectrum analyzers, Calibration), (*Oscillators, Spectrum analyzers), Instruction manuals, Test methods, Electronic equipment.

The manual describes the calibration procedure for the AN/UPM-17 Spectrum Analyzer, which consists of the IP-130/UPM-17 Pulse Analyzer Indicator and the TN-188/UPM R-F Tuner plus accessories. The Test Instrument is used to analyze the frequency spectrum and pulse shape of pulsed RF oscillators in the frequency range of 10 to 16,000 MHz.

**PB-168 669** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**MEMO-SCOPE TYPE 104E (HUGHES PRODUCTS).**
Technical manual instrument calibration procedure AW-34.
15 Jul 65, 21p
Contract N123 (62861)35056)A
NAVWEPS 17-20AW-34
Distribution: No limitation.

Descriptors: (*Oscillographs, Calibration), (*Test equipment (Electronic), Oscillographs), Oscilloscopes, Recording systems, Instruction manuals, Test methods.

The manual describes the calibration procedure for the Hughes Products Type 104E Memo-Scope. The Test Instrument combines the functions of a conventional oscilloscope with those of a recording oscillograph.

**PB-168 670** **Field 9C**
**CFSTI Prices: HC$2.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**OSCILLOSCOPES OS-62B/USM-50B (AN/USM-50B) OS-62C/UMS-50C (AN/USM-50C).**
Technical manual instrument calibration procedure AW-28.
15 Jul 65, 26p
Contract N123 (62861)35056A
NAVWEPS 17-20AW-28
Distribution: No limitation.

Descriptors: (*Oscilloscopes, Calibration), (*Test equipment (Electronics), Oscilloscopes), Instruction manuals, Test methods.

The manual describes the calibration procedure for the OS-62B/USM-50B and OS-62C/USM-50C oscilloscopes, which are general purpose wide range oscilloscopes used for observing signals between 3 cps and 15 Mc.

**PB-168 671** **Field 9E**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**MODULATING POWER SUPPLY MODEL 1264-A (GENERAL RADIO).**
Technical manual instrument calibration procedure AH-12.
1 Jul 65, 14p NAVWEPS-17-20AH-12
Distribution: No limitation.

Descriptors: (*Oscillators, Power supplies), (*Power supplies, Calibration), Instruction manuals, Test methods, Electronic equipment.

The General Radio 1264-A modulating power supply is a power supply designed for use with the GR 1361-A oscillator to permit CW or square-wave modulated operation. By use of special GR adapter cables, the Test Instrument may also be used with the GR 1209-B, 1209-BL, 1215, or 1218 oscillators. The oscillator output also may be pulse-modulated by connecting an external pulse generator to the Test Instrument.

**PB-168 675** **Field 9E**
**CFSTI Prices: HC$1.00 MF$0.50**
Navy Electronics Lab., San Diego, Calif.
**DESIGN OF GROUND SYSTEM OF RADIAL CONDUCTORS FOR A VLF TRANSMITTER.**
Final rept.,
by F. R. Abbott and C. J. Fisher. 10 Feb 49, 21p
USNEL-105
ATI 80 409
Distribution: No limitation.

Descriptors: (*Radio transmitters, Very low frequency), Design, Optimization, Antennas, Electric currents, Power.

A technique for achieving optimum design of radialconductor ground systems was developed and applied to the Wheeler Mountain FRT-3 antenna in the Puget Sound area.

**PB-168 693** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Milmanco Corp., Renton, Wash.
**IMPEDANCE BRIDGE, MODEL 1650-A (GENERAL RADIO).**
Technical manual instrument calibration procedure, AZ-24.
15 Jul 65, 13p
Contract N123 (62861)51295A
NAVWEPS 17-20AZ-24
Distribution: No limitation.

Descriptors: (*Impedance bridges, Calibration), (*Test equipment (Electronics), Impedance bridges), Instruction manuals, Test methods, Measuring devices (Electrical + Electronic).

The manual describes the calibration procedure for the General Radio 1650-A impedance bridge hereafter referred to as the Test Instrument. The Test Instrument measures the inductance and storage factor of inductors, the capacitance and dissipation factor of capacitors, and the ac and dc resistance of all types of resistors.

**PB-168 694** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
SSCO Standards Lab., Inc., Southfield, Mich.
**MICRO MIKER MODELS 402B (KAY LAB), 402D (CES ELECTRONIC PRODUCTS, INC.).**
Technical manual instrument calibration procedure, AC-14.
15 Aug 65, 10p
Contract N123 (62861)35059A
NAVWEPS 17-20AC-14
Distribution: No limitation.

Descriptors: (*Inductance, Measuring devices (Electrical + Electronic)), (*Capacitance, Measuring devices (Electrical + Electronic)), (*Test equipment (Electronics), Calibration), Microphones, Instruction manuals, Test methods.

The manual describes a limited calibration procedure for the CES Electronic Products, Inc. Model 402D and the Kay Lab Model 402B Micro Miker which measures inductance and capacitance at a frequency of 1 Mc.

**PB-168 695** **Field 9C**
**CFSTI Prices: HC$2.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**OSCILLOSCOPE TYPE 516 (TEKTRONIX).**
Technical manual instrument calibration procedure, AW-37.
1 Dec 64, 37p
Contract N123 (62861)35056A
NAVWEPS 17-20AW-37
Distribution: No limitation.

Descriptors: (*Oscilloscopes, Calibration), (*Test equipment (Electronics), Oscilloscopes), Instruction manuals, Test methods.

The manual describes the calibration procedure for the Tektronix, Inc., Type 516 Oscilloscope which is a general purpose, laboratory instrument having two identical vertical amplifiers with dual-trace capabilities for monitoring two waveforms simultaneously. The Test Instrument has calibrated vertical sensitivities and sweep speeds, and contains a square wave calibrator. The sweep may be triggered manually or automatically from either internal or external sources. The vertical system features a delay line which delays the input signal to the vertical deflection plates so that the trace starts before the leading edge of the displayed waveform.

**PB-168 696** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**UHF STANDARD SIGNAL GENERATOR MODEL 1021-AU (GENERAL RADIO).**
Technical manual instrument calibration procedure, AG-80.
1 Sep 65, 16p

Contract N123 (62861)35056A
NAVWEPS 17-20AG-80
Distribution: No limitation.

Descriptors: (*Signal generators, Calibration), Ultrahigh frequency, Standards, Test equipment (Electronics), Instruction manuals, Test methods.

The manual describes the calibration procedure for the General Radio 1021-AU UHF Standard Signal Generator. The Test Instrument consists of a Type 1021-P2 U-H-F Unit and a Type 1021-P1 Power Supply. The Test Instrument covers a frequency range from 250 to 940 Mc in one band, and has a power output of 0.5 microvolt to 1 volt behind 50 ohms.

**PB-168 698** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Burroughs Corp., Radnor, Pa.
**ECHO BOX, FR-144/U, FR-133/SPS-5, AND MODELS 3432 (RAYTHEON COMPANY), 86-18209 (JOHNSON SERVICE COMPANY).**
Technical manual instrument calibration procedure, GF-15.
1 Jul 65, 14p
Contract N123 (62861)51297A
NAVWEPS 17-20GF-15
Distribution: No limitation.

Descriptors: (*Radar equipment, Test equipment (Electronics)), (*Test equipment (Electronics), Calibration), Ammeters, Resonators, Instruction manuals, Test methods.

The manual contains the information necessary for calibrating the following test sets: FR-144/U, FR-133/SPS-5, Raytheon Company model 3432, and Johnson Service Company model 86-18209. This portable echo box permits the field testing of radars operating in the frequency range of 5440 megacycles to 5840 mecacycles. A hand-tuned resonator of high Q and a microammeter comprise the Test Instrument. RF energy is introduced into the resonator by means of a probe which is connected by a flexible cable to the test point of the radar. The microammeter and its associated crystal rectifier are used to indicate when the resonator is tuned to resonance.

**PB-168 699** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**TRANSISTOR-DIODE TESTER MODEL NO. 219Z (SIERRA ELECTRONIC DIVISION OF PHILCO CORPORATION).**
Technical manual test equipment calibration procedures, QAB-3.
15 Oct 65, 9p NAVWEPS-17-20QAB-3
Distribution: No limitation.

Descriptors: (*Semiconductor devices, Test equipment (Electronics)), (*Test equipment (Electronics), Calibration), Transistors, Diodes (Semiconductor), Instruction manuals, Test methods.

The manual contains instructions for calibration of the Transistor-Diode Tester, Model 219Z. The Test Instrument will always be calibrated after servicing or after it has been in storage for a prolonged period.

**PB-168 700** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**AUDIO VOLTAGE STANDARD, MODEL AVS-321 (HOLT INSTRUMENT CO.).**
Technical manual instrument calibration procedure, AH-13.
15 Aug 65, 20p
Contract N123 (62861)35056A
NAVWEPS 17-20AH-13
Distribution: No limitation.

Descriptors: (*Audiofrequency, Voltage regulators), (*Voltage regulators, Calibration), Standards, Instruction manuals, Test methods.

The manual describes the calibration procedure for the Holt Instrument Laboratories Model AVS-321, Audio Voltage Standard. The Test Instrument is a stable, electromechanical, audio frequency, voltage regulator. It includes an audio power amplifier with a multi-tap output transformer. When driven by a low distortion audio oscillator, the Test Instrument will provide voltages from 1 to 1000 volts at frequencies from 35 to 10,000 Hz.

**PB-168 701** **Field 9C, 17I**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**RADAR TEST SET AN/UPM-6B.**
Technical manual instrument calibration procedure, GQ-12.
1 Jul 65, 19p NAVWEPS-17-20GQ-12
Distribution: No limitation.

Descriptors: (*Radar equipment, Test set), (*Test set, Calibration), Instruction manuals, Test methods.

Identifier: AN/UPM-6.

The manual describes the calibration proceedure for the AN/UPM-6B radar test set. The test instrument is a portable unit used to measure frequency, power, and sensitivity of pulse-type equipments operating in the frequency band from 980 to 1125 Mc.

**PB-168 756** **Field 9B, 5G, 5B**
**CFSTI Prices: HC$2.00 MF$0.50**
Linguistics Research Center, Univ. of Texas, Austin.
**CENI: A DOCUMENT PROCESSING PROGRAM,**
by Richard Jernigan. Nov 65, 26p LRC-65-WT-1
Contract DA-36-039-AMC-02162; Grant NSF-GN-308
Distribution: No limitation.

Descriptors: (*Classification, Automatic), (*Programming (Computers), Classification), Reports, Numbers.

Identifiers: Binary-decimal code, CENI computer program, IBM 7040/7044, Fortram IV language, MAP programming language, Alpha-numeric symbols.

CENI was written to accomplish the following task: Given BCD records consisting of document numbers and keywords pertaining to the documents, CENI reads all the document records and numbers the keywords in alphabetical order by creating a tree structure in core. This tree structure may then be edited by deleting words, adding words, or changing the number assigned to a word by the alphabetical ordering. The tree structure, either original or in edited form, is then used in a second pass through the document data to create a file consisting of one binary record for each document. This record contains its document number, number of keywords, and keyword numbers in ascending order. This output, called 'incidence data,' is used as input for automatic classification programs. (Author)

**PB-168 759** **Field 9B, 5G**
**CFSTI Prices: HC$4.00 MF$0.75**
Linguistics Research Center, Univ. of Texas, Austin.
**INFORMATION MAINTENANCE SYSTEM DOCUMENTATION,**
by J. C. Smith and N. J. Lisso. Aug 65, 117p LRC-65-TS-4
Contract DA-36-039-AMC-02162 (E); Grant NSF-GN-308
Continuation of Grant NSF-GN-208. Distribution: No limitation.

Descriptors: (*Data storage systems, Documentation), (*Information retrieval, Data storage systems), Computational linguistics, Magnetic tape, Punched cards, Computer logic.

Identifiers: Alpha-numeric symbols, Sorting (Computers), Coding (Documentation), IBM 7040/7044, File structures, IBM 7090/7094.

The programs, data formats, and operating conventions of a generalized, coordinate information storage system are described. Designed to maintain an unlimited number of separate information stores with individual entries identified by alpha-numeric descriptors, the system provides a common store for the proofs of all user-requests to change the separate stores. The programs have been adapted to operate on the IBM 7090-94 as well as the IBM 7040-44. (Author)

**PB-168 778** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**SIGNAL GENERATOR MODEL MSG-34 (POLARAD ELECTRONIC INSTRUMENTS).**
Technical manual instrument calibration procedure, GG-22.
1 Sep 65, 24p
Contract N123 (62861)35056A
NAVWEPS 17-20GG-22
Distribution: No limitation.

Descriptors: (*Signal generators, Calibration), Broadband, Microwave equipment, Instruction manuals, Test methods, Test equipment (Electronics).

The manual describes the calibration procedure for the Polarad Electronic Instruments Model MSG-34, Broadband Microwave Signal Generator. The Test Instrument is capable of generating low power CW, pulse modulated, square-wave modulated, or FM signals within the range of 4,200 to 11,000 Mc.

**PB-168 780** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Boeing Co., Seattle, Wash. Aero-Space Div.
**MARKA-SWEEP GENERATOR MODEL IF, CATALOG NO. 370-A (KAY ELECTRIC CO.).**
Technical manual instrument calibration procedure, AG-89.
15 Aug 65, 13p
Contract N123 (62861)35056A
NAVWEPS 17-20AG-89
Distribution: No limitation.

Descriptors: (*Sweep generators, Calibration), Oscilloscopes, Test equipment (Electronics), Instruction manuals, Test methods.

The manual describes the calibration procedure for the Kay Electric Co. model IF, Catalog No. 370-A, Marka-Sweep Generator. The Test Instrument is a combination sweeping oscillator and marker generator designed for use in conjunction with an oscilloscope.

**PB-168 781** **Field 9C**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Naval Weapons, Washington, D. C.
**RADIO TEST SET AN/ARM-22.**
Technical manual instrument calibration procedure, GG-21.
15 Jun 65, 23p NAVWEPS-17-20GG-21
Distribution: No limitation.

Descriptors: (*Radio equipment, Test sets), (*Test sets, Calibration), Navigational aids, Instruction manuals, Test methods, Test equipment (Electronics).

Identifiers: TACAN.

The manual describes the calibration procedure for the AN/ARM-22 Radio Test Set, which is designed to simulate surface-beacon signals and to produce other signals for testing airborne TACAN radio equipment such as the AN/ARN-21 Radio Set.

## 10. ENERGY CONVERSION (NON-PROPULSIVE)

**AD-278 426** **Field 10B, 10C**
**CFSTI Price: HC$2.00**
Aerojet-General Corp., Azusa, Calif.
**INVESTIGATION OF AN ENERGY CONVERSION DEVICE.**
Quarterly progress rept. no. 3, 1 Jan-31 Mar 62, by R. F. Fogle and H. E. Lawson. Apr 62, 34p Rept. no. 0528-01-3
Contract DA-36-039-sc-87229, Task 3A99-09-001-02
Distribution: No limitation.

Descriptors: (*Power supplies, Energy conversion), (*Energy conversion, Electrolytic cells), Dry cells, Fuel cells, Electrolytes, Cathodes (Electrolytic cells), Anodes (Electrolytic cells), Nickel electrodes, Seals, Ceramic materials, Encapsulation, Materials, Bismuth compounds, Iodides, Electrochemistry, Primary batteries.

Several sealed, regenerative cells containing graphite cathodes, nickel anodes, and electrolyte No. 14 were operated in an argon atmosphere under various loads. A current density of 13.7 milliamps/sq cm at 0.22 v was obtained at 740 C. Regenerative cells of the same type containing electrolyte No. 12 were operated in air under various loads. At a hot-side temperature of 630 C, a current density of 1.31 milliamps/sq cm at 0.21 v was obtained. Several sealed, regenerative cells containing graphite cathodes, nickel anodes, and electrolyte No. 12 were operated in air on a 415-ohm load at a hot-side temperature of 550 C. One cell had an operational life of 148 hours at an average voltage of 0.175 v; another cell had a life, before mechanical failure, of 128 hours with an average voltage of 0.145 v. Cell construction using metal-to-metal seals in conjunction with commercial metal-to-ceramic seals were unsatisfactory. (Author)

**AD-278 480** **Field 10B, 10C**
**CFSTI Price: HC$2.00**
Aerojet-General Corp., Azusa, Calif.
**INVESTIGATION OF AN ENERGY CONVERSION DEVICE.**
Quarterly progress rept. no. 2, 1 Oct-31 Dec 61, by R. F. Fogle and H. E. Lawson. May 62, 28p Rept. no. 0528-01-2
Contract DA-36-039-sc-87229, Task 3A99-09-001-02
Distribution: No limitation.

Descriptors: (*Power supplies, Energy conversion), (*Energy conversion, Electrolytic cells), Dry cells, Fuel cells, Electrolytes, Cathodes (Electrolytic cells), Anodes (Electrolytic cells), Nickel electrodes, Seals, Ceramic materials, Encapsulation, Materials, Bismuth compounds, Iodides, Electrochemistry, Primary batteries.

A number of cells using various ceramic seals and methods of construction were built and tested in air on a constant resistance of 415 ohms. In the cells tested, reactants were lost from the cell during operation because of mechanical failure of the sealing materials. Even with this loss, operation on intermittent tests was increased to nearly eight days. (Author)

**BNL-8187** **Field 10A, 20M**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**EFFECT OF INCLINATION ON RADIANT HEAT TRANSFER THROUGH AN APERTURE WITH RERADIATIVE WALLS,**
by Chia-Jung Hsu. Jan 64, 25p
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Radiation (Heat transfer), Heat shields), (*Thermionic converters, Radiation (Heat transfer)).

**N65-17538** **Field 10A**
**CFSTI Prices: HC$2.00 MF$0.50**
Clevite Corp., Cleveland, Ohio. Electronic Research Div.
**DEVELOPMENT OF CADMIUM SULFIDE THIN FILM PHOTOVOLTAIC CELLS.**
Quarterly rept. no. 1, 15 Oct 64-14 Jan 65, by F. Augustine, W. Bower, and F. A. Shirland. 4 Feb 65, 27p
Contract NAS3-6461
NASA CR-54302
Distribution: No limitation.

Descriptors: (*Photoelectric cells (Semiconductor), Films), (*Cadmium compounds, Sulfides).

Identifiers: Cadmium sulfide.

**N65-18050** **Field 10A**
**CFSTI Prices: HC$2.00 MF$0.50**
TRW Space Technology Labs., Redondo Beach, Calif. Solid State Physics Lab.
**CHARGED PARTICLE RADIATION DAMAGE IN SEMICONDUCTORS. IX. PROTON RADIATION DAMAGE IN SILICON SOLAR CELLS.**
Final rept.,
by J. M. Denney and R. G. Downing. 31 Aug 63, 42p Rept. nos. MR-32, 8653-6026-KU-000
Contract NAS5 1851
NASA CR-57040
Distribution: No limitation.

Descriptors: (*Solar cells, Radiation damage), (*Semiconductors, Radiation damage).

**N65-18919** **Field 10B**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**INVESTIGATIONS OF CARBIDES AS CATHODES FOR THERMIONIC SPACE REACTORS.**
Informal monthly rept., Mar 63,
by L. Yang, A. F. Weinberg, F. D. Carpenter, M. H. Horner, and R. G. Hudson. 29 Apr 63, 24p GACD-4210
Contract NAS3-2532, Proj. 306
NASA CR-57167
Distribution: No limitation.

Descriptors: (*Cathodes (Electrolytic cell), Carbides), (*Carbides, Cathodes (Electrolytic cell)), (*Thermal reactors, Carbides).

**N65-18920** **Field 10A**
**CFSTI Prices: HC$3.00 MF$0.75**
Allis-Chalmers Mfg Co., Milwaukee, Wis. Research Div.
**RESEARCH AND DEVELOPMENT ON FUEL CELL SYSTEMS.**
Quarterly progress rept., no. 2, 1 Oct-31 Dec 64, by J. L. Platner. 26 Feb 65, 73p NAS8-2696
Contract NAS8-2696
NASA CR-57154
Distribution: No limitation.

Descriptors: (*Fuel cells, Design).

**N65-19690** **Field 10A**
**CFSTI Prices: HC$1.00 MF$0.50**
Electro Optical Systems, Inc., Pasadena, Calif.
**HYDROGEN-OXYGEN ELECTROLYTIC REGENERATIVE FUEL CELLS.**
Progress report Oct 5-Nov 6 1964, by M. Klein. 10 Nov 64, 25p EOS-4110-ML-13
Contract NAS3 2781
NASA CR-57294
Distribution: No limitation.

Descriptors: (*Fuel cells, Design).

**N65-20416** **Field 10B**
**CFSTI Prices: HC$1.00 MF$0.50**
Garrett Corp., Los Angeles, Calif., AiResearch Mfg. Div.
**RECUPERATOR DEVELOPMENT PROGRAM. SOLAR BRAYTON CYCLE SYSTEM.**
Progress rept. 19 Jul-19 Aug 1 64, by A. F. Anderson and E. F. Timpke. 31 Aug 64, 22p L-9375, AM-288
Contract NAS3-2793
NASA CR-57617
Distribution: No limitation.

Descriptors: (*Solar collectors, Brayton cycle), (*Argon, Solar collectors).

**N65-20417** **Field 10B**
**CFSTI Prices: HC$1.00 MF$0.50**
Garrett Corp., Los Angeles, Calif., AiResearch Mfg. Div.
**RECUPERATOR DEVELOPMENT PROGRAM. SOLAR BRAYTON CYCLE SYSTEM.**
Progress rept. Nov 64-Jan 65, by L. E. Evans. 1 Feb 65, 8p L-9379
Contract NAS3-2793
NASA CR-57620
Distribution: No limitation.

Descriptors: (*Solar collectors, Brayton cycle), (*Argon, Solar collectors).

**N65-20488** **Field 10A, 11F**
**CFSTI Prices: HC$7.00 MF$2.00**
General Electric Co., Cincinnati, Ohio. Space Power and Propulsion Section.
**ALKALI METALS BOILING AND CONDENSING INVESTIGATIONS.**
Quarterly progress rept. no. 10, 1 Oct-31 Dec 64, by F. E. Tippets and G. L. Converse. 20 Jan 65, 381p
Contract NAS3-2528
NASA CR-54308
Distribution: No limitation.

Descriptors: (*Alkali metals, Boiling), (*Potassium, Condensation).

**N65-20756** **Field 10B**
**CFSTI Prices: HC$3.00 MF$0.75**
Electro-Optical Systems, Inc., Pasadena, Calif.
**DESIGN STUDY OF A SOLAR HYDROGEN PROPULSION AND POWER SYSTEM.**
Quarterly rept. 17 May-17 Aug 63, by F. MacFarlane. 9 Sep 63, 74p EOS-4000-Q-1
Contract NAS7-231
NASA CR-57743
Distribution: No limitation.

Descriptors: (*Solar collectors, Hydrogen), (*Hydrogen, Solar collectors).

**N65-21346** **Field 10A, 11B**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**INVESTIGATIONS OF CARBIDES AS CATHODES FOR THERMIONIC SPACE REACTORS.**
Informal monthly rept. for 1 Sep-30 Sep 62, by L. Yang, A. F. Weinberg, F. D. Carpenter, and R. G. Hudson. 30 Sep 62, 20p GACD-3760
Contract NAS3-2532, Proj. 306.00
NASA CR-57899
Distribution: No limitation.

Descriptors: (*Carbides, Thermionic emission), (*Thermionic emission, Carbides), (*Thermionic converters, Cathodes).

**N65-21347** **Field 10A, 11B**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**INVESTIGATIONS OF CARBIDES AS CATHODES FOR THERMIONIC SPACE REACTORS.**
Informal monthly rept. for 1 Oct-31 Oct 62, by L. Yang, A. F. Weinberg, F. D. Carpenter, and R. G. Hudson. 31 Oct 62, 15p GACD-3825

Contract NAS3-2532,
Proj. 306
NASA CR-57897
Distribution: No limitation.

Descriptors: (*Carbides, Thermionic emission), (*Thermionic emission, Carbides), (*Thermionic converters, Cathodes).

**N65-21348** **Field 10A, 11B**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**INVESTIGATIONS OF CARBIDES AS CATHODES FOR THERMIONIC SPACE REACTORS.**
Informal monthly rept. for 1 Dec-31 Dec 62,
by L. Yang, A. F. Weinberg, F. D. Carpenter, andR. G. Hudson. 31 Dec 62, 25p GACD-3960
Contract NAS3-2532,
Proj. 306
NASA CR-57895
Distribution: No limitation.

Descriptors: (*Carbides, Thermionic emission), (*Thermionic emission, Carbides), (*Thermionic converters, Cathodes).

**N65-21349** **Field 10A, 11B**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**INVESTIGATIONS OF CARBIDES AS CATHODES FOR THERMIONIC SPACE REACTORS.**
Informal monthly rept. for 1 Jan-31 Jan 63,
by L. Yang, A. F. Weinberg, F. D. Carpenter, andR. G. Hudson. 31 Jan 63, 25p GACD-4008
Contract NAS3-2532,
Proj. 306
NASA CR-57898
Distribution: No limitation.

Descriptors: (*Carbides, Thermionic emission), (*Thermionic emission, Carbides), (*Thermionic converters, Cathodes).

**N65-21351** **Field 10A, 11B**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**INVESTIGATIONS OF CARBIDES AS CATHODES FOR THERMIONIC SPACE REACTORS.**
Informal monthly rept. for 1 Jul-31 Jul 63,
by L. Yang, A. F. Weinberg, F. D. Carpenter,R. G. Hudson, and J. R. Lindgren. 16 Aug 63, 19p GACD-4508
Contract NAS3-2532,
Proj. 306
NASA CR-57896
Distribution: No limitation.

Descriptors: (*Carbides, Thermionic emission), (*Thermionic emission, Carbides), (*Thermionic converters, Cathodes).

**N65-24894** **Field 10C**
**CFSTI Prices: HC$1.00 MF$0.50**
Marine Engineering Lab., Annapolis, Md.
**CHARGE-CURRENT CONTROL CIRCUIT FOR NICKELCADMIUM CELLS WITH CONTROL ELECTRODES,**
by P. P. M. Liwski. Apr 65, 19p MEL-25/65
NASA CR-62959
Distribution: No limitation.

Descriptors: (*Alkaline cells, Maintenance) (*Circuits, Maintenance).

A circuit to control charge current entering nickel-cadmium cells with control electrodes ('three-terminal' cells) was developed for use in systems requiring minimum space and weight with optimum control satellite applications. The potential on the third (control) electrode of a cell becomes input to determine time and manner of charge-current change. (Author)

**N65-29293** **Field 10A, 11C**
**CFSTI Prices: HC$2.00 MF$0.50**
Harshaw Chemical Co., Cleveland, Ohio. Crystal-Solid State Div.
**DEVELOPMENT OF OPTICAL COATINGS FOR CdS THIN FILM SOLAR CELLS.**
Quarterly rept. no. 2 1 Mar-1 Jun 65,
by J. C. Schaefer and E. R. Hill. 1965, 25p
Contract NAS3-6464
NASA CR-54452
Distribution: No limitation.

Descriptors: (*Solar cells, Optical coatings), (*Optical coatings, Solar cells).

**N65-32965** **Field 10B**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**EFFECT OF ADDING TUNGSTEN FILLER MATERIAL TO BERYLLIA MAGNESIA THERMAL STORAGE MATERIAL IN A SOLAR THERMIONIC POWER SYSTEM,**
by William J. Bifano and James J. Ward. Sep 65, 28p
NASA TND-2978
Distribution: No limitation.

Descriptors: (*Thermionic converters, Materials), (*Ceramic materials, Thermal properties).

**N65-34427** **Field 10B**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**THERMAL CYCLING AND HEAT DAMAGE TESTS OF THIN-FILM CADMIUM SULFIDE SOLAR CELLS,**
by John G. Ewashinka and George K. Stephenson, Jr. Oct 65, 21p
NASA TND-3038
Distribution: No limitation.

Descriptors: (*Solar cells, Films), (*Cadmium compounds, Sulfides).

**Patent 3,217,199** **Field 10A**
**HOMOPOLAR GENERATOR.**
Patent assigned to AEC,
by Edmond E. Musset. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Generators, Polarization), Patents, Voltage, Rings, Magnetic properties.

The homopolar generators are used in very high direct current applications. A more efficient type of homopolar generator rotor is provided having at load conditions a lower internal voltage drop and lower excitation power requirements than prior art devices. A plurality of nonmagnetic rings are imbedded in the periphery of the rotor and axially spaced therealong.

## 11. MATERIALS

**ACF-10** **Field 11I**
**CFSTI Prices: HC$2.00 MF$0.50**
ACF Industries, Inc., Albuquerque, N. Mex.
**PHYSICAL PROPERTY STUDY OF POLYSTYRENE FOAM (210-050),**
by T. D. McCandless. 30 Jun 65, 32p ACF-412-248
Contract AT (29-1)-1352
Distribution: No limitation.

Descriptors: (*Styreme plastics, Physical properties), (*Expanded plastics, Physical properties).

**AD-283 422** **Field 11G**
**CFSTI Price: HC$2.00**
Raytheon Co., Waltham, Mass. Research Div.
**NONLINEAR MICROWAVE DIELECTRIC MATERIALS.**
Quarterly progress rept. no. 3, 15 Mar-15 Jun 62,
by G. Rupprecht, R. O. Bell, J. S. Waugh,B. di Benedetto and W. Winter. 15 Jun 62, 41p Rept. no. 7; S-444
Contract DA-36-039-sc-98126
Continuation of Contract DA-36-039-sc-87369.
Distribution: No limitation.

Descriptors: (*Dielectrics, Crystals), Microwave frequency, Dielectric properties, Calcium compounds, Titanates, Strontium compounds, Barium compounds, Hafnium compounds, Stannates, Hightemperature research, Doping, Single crystals, Ferroelectric crystals, Materials, Lead compounds.

High temperature microwave dielectric constants have been measured for CaTiO3 and Ca0.2Sr0.8TiO3. Single crystal KTaO3 has been prepared and its microwave dielectric constants and loss tangents have been measured. Low frequency dielectric constants have been measured for compounds from the ternary systems SrT1-xSnxO3, BaHfxTi1-xO3 and from the quaternary system Ba1-xSrxHf1-yTiyTO3. The nonlinearity coefficients for polycrystalline BST-50 plus 1 percent SrSnO3 have been measured at microwave and at low frequencies; the two results are in poor agreement. Low frequency measurements of nonlinearity in BST-50 plus 1 percent CaTiO3 have also been taken. (Author)

**AD-294 677** **Field 11H, 7C**
**CFSTI Prices: HC$3.00**
Naval Engineering Experiment Station, Annapolis, Md.
**FLUID STRUCTURAL FACTORS VERSUS FIRE RESISTANCE.**
Research and development rept.,
by C. L. Brown. 9 Nov 62, 52p NAVENGRX-STA-95-648C
Proj. S-R001-07-01,
Task 0620
Distribution: No limitation.

Descriptors: (*Fire-resistant materials, Molecular structure), (*Lubricants, Flammability), (*Hydraulic fluids, Flammability), Compressive properties, Ignition, Calorimetry, Petroleum, Organic phosphorus compounds, Halogenated hydrocarbons, Fire extinguishers, Phenyl ethers, Esters, Silanes, Colloids.

Experiments were conducted to correlate pertinent aspects of fire resistance with the molecular structure of a large variety of compressor lubricants and hydraulic fluids, as well as with compounds of known structure that might be useful in the formulation of such fluids. As a result of these experiments and of consideration of theoretical approaches to predicting fire resistance, several atomic groupings and molecular structures were identified as particularly significant in contributing to fluid fire resistance under conditions of compression ignition. These include phenyl and phenoxy groups, halides, phosphate radicals, phosphorus-nitrogen bonded structure, and hydroxyl groups. This information indicates that there are several possible avenues to follow in development of functional fire resistant fluids. Further research should be aimed at producing fluids based on these types of molecular structures, which also have the other properties required for functional fluids. (Author)

**AD-407 959** **Field 11G**
**CFSTI Price: HC$3.00**
Raytheon Co., Waltham, Mass. Research Div.
**MICROWAVE FERROELECTRICS.**
Quarterly progress rept. no. 6, 16 Dec 62-15 Mar 63,
by B. di Benedetto, M. Harris and P. B. Nutter. 15 Mar 63, 55p Rept. no. 10, S-532
Contract DA-36-039-sc-89126
See also AD-423 650. Distribution: No limitation.
Continuation of Contract DA-36-039-sc-87369.

Descriptors: (*Ferroelectric materials, Dielectric properties), (*Dielectric properties, Microwave frequency), Barium compounds, Titanates, Doping, Strontium compounds, Stanates, X band, Electric fields, Ceramic materials.

Several batches of Ba0.5 Sr0.5 TiO3 + 1%SrSnO3 ceramic have been prepared and those which have been measured all exhibit a slightly larger nonlinearity than pure Ba0.5 Sr0.5 TiO3 material. One sample only shows a markedly larger nonlinearity which has been confirmed by repeated measurements and by using different measuring techniques. The reason for its superiority over supposedly identical materials has not been established. Losses in other doped materials have been measured. The field dependent loss in Ba0.5 Sr0.5 TiO3 material has been measured and an upper limit set upon its value. The value of the field dependent loss is small compared with the intrinsic zero-field loss at X-band, at 150C and for fields of 1,600,000 volts/metre. (Author)

**AD-418 279** **Field 11B**
**CFSTI Price: HC$2.00**
Systems Research Labs., Inc., Dayton, Ohio.
**THE ELECTRICAL BEHAVIOR OF REFRACTORY OXIDES.**
Summary progress rept., 15 Feb 61-1 Feb 63,
by R. W. Vest. Jul 63, 49p
Contract AF33 (616)-7748,
Proj. AF-7022,
Task 702202
ARL 63-116
Distribution: No limitation.

Descriptors: (*Refractory materials, Oxides), (*Ceramic materials, Electrical properties), Electrical conductance, Thermoelectricity, Thermodynamics, Theory, Transport properties, Zirconium compounds, Calcium compounds, Chromium compounds, Aluminum compounds, Controlled atmosphere, Electric potential, Semiconductors, Oxygen, Pressure, Solid solutions.

The research described was an attempt to gain a better mechanistic understanding of charge and mass transport in non-metallic, refractory materials, particularly metal oxides. Special research instrumentation was developed to permit measurements of electrical conductivity and thermoelectric power under conditions of controlled oxygen partial pressure and temperature. A special apparatus for determination of voltage transients and long time polarization was also developed. The solid solution Zr0.85Ca0.1501.85 was shown to be an intrinsically pure oxygen ion conductor at temperatures above 100 C. The polarization technique developed under this program was used to investigate the mixed ionic and electronic conduction. (Author)

**AD-421 884** **Field 11E**
**CFSTI Price: HC$2.00**
Solar, San Diego, Calif.
**EXPLORATION AND EVALUATION OF NEW GLASSES IN FIBER FORM.**
Bi-monthly progress rept. no. 4, 16 Aug-15 Oct 63,
by Gunther K. Schmitz. 24 Oct 63, 28p Technical memo-219, RDR-1343-4
Contract Nonr-3654 (00),
Proj. NRL-62-R05-19A
Distribution: No limitation.

Descriptors: (*Glass textiles, Mechanical properties), Failure (Mechanics), Filaments, Damage.

Tests on virgin E-glass fibers were completed and results are presented. The artificial fiber damage program is in progress on both E and S-glass. This portion of the work represents the final phase of this year's major task, demonstration of the postulated damage model. (Author)

**AD-423 650** **Field 11G**
**CFSTI Price: HC$3.00**
Raytheon Co., Waltham, Mass. Research Div.
**MICROWAVE FERROELECTRICS.**
Quarterly progress rept. no. 7, 16 Mar-15 Jun 63,
by M. Harris, P. B. Nutter and J. S. Waugh. 15 Jun 63, 55p Rept. no. 11, S-557
Contract DA-36-039-sc-89126
See also AD-424 626. Distribution: No limitation.
Continuation of Contract DA-36-039-sc-87369.

Descriptors: (*Ferroelectric materials, Dielectric properties), (*Dielectric properties, Microwave frequency), Titanates, Strontium compounds, Barium compounds, Doping, Stanates, S band, Microstructure, Annealing, Cryogenics, Electric fields.

The enhanced nonlinearity of BST-50 + 1% SrSnO3-B has been the subject of continued investigation. The quality of the microstructure of various other stannate doped BST-50 materials does not correlate with the observed nonlinearity at all. Annealing of the high nonlinearity materials has been observed to decrease the nonlinearity by as much as a factor of two. It is not thought that the grain size is relevant to nonlinearity unless it is the presence of very small grains which is important. In this case the effect of annealing must presumably proceed by volatilization of the tin or by segregation in the material. The field dependent losses in single crystal SrTiO3 have been measured at 77K. Various features of this experiment suggest previously unknown materials problems possibly connected with lack of homogeneity for short periods after application of a field. (Author)

**AD-424 626** **Field 11G**
**CFSTI Price: HC$3.00**
Raytheon Co., Waltham, Mass. Research Div.
**MICROWAVE FERROELECTRICS.**
Final rept. 15 Sep 61-14 Sep 63,
by W. Gregory, M. Harris, P. B. Nutter and J. S. Waugh. 14 Sep 63, 62p Rept. no. 12, S-586
Contract DA-36-039-sc-89126
See also AD-423 650. Distribution: No limitation.
Continuation of Contract DA-36-039-sc-87369.

Descriptors: (*Ferroelectric materials, Dielectric properties), (*Dielectric properties, Microwave frequency), S band, Barium compounds, Strontium compounds, Titanates, Doping, Hafnium compounds, Oxides, Aluminum compounds, Resistance (Electrical), Stanates, Resonant frequency, Electric fields.

The dielectric nonlinearity of various materials has been investigated at S-band. Ba0.5 Sr0.5 TiO3 doped with 1 or 2 percent of BaHfO3 transpires to have nonlinearities indistinguishable from those of the undoped material. The same material when doped with 5 percent Al2O3 has been found to exhibit significantly larger nonlinearities than are typical for the pure material. The electrical resistivity of the alumina doped samples was exceptionally low however. Samples of SrTiO3 doped with 1 and 5 percent of SrSnO3 have been found to have nonlinearities in excess of those previously measured for pure SrTiO3. The increase appears to be more marked for the 1 percent material than for the 5 percent and the effect has not been definitely attributed to the tin doping. Anomalous features of the microwave resonances observed in samples of SrTiO3 under conditions of applied dc field are discussed. A cavity perturbation technique for measurement of dielectric properties near the Curie temperature has been developed. The technique uses exact calculation to replace the usual 'small perturbation' assumptions which are invalid for high dielectric constant materials. (Author)

**AD-443 654** **Field 11F, 21H**
**CFSTI Price: HC$2.00**
Naval Weapons Lab., Dahlgren, Va.
**PLANE STRAIN FRACTURE TOUGHNESS BY THE SLOW BEND TEST AND THROUGH-THICKNESS TENSILE PROPERTIES OF UNWELDED 18 Ni (250) MARAGING STEEL PLATE 3/4 INCH THICK BEING STUDIED FOR USE IN LARGE SOLID-PROPELLANT BOOSTER ROCKETS,**
by H. E. Romine. 30 Jun 64, 48p NWL-1923
Distribution: No limitation.

Descriptors: (*Maraging steels, Fracture (Mechanics)), (*Fracture (Mechanics), Toughness), Test methods, Tensile properties, Metal plates, Rocket cases, Booster motors, Rocket motors (Solid propellant), Annealing.

The plate samples were from two sources A and B and represented cuts from the same ingot of air-melted steel rolled into plate stock for studies in the fabrication of a 260 inch booster rocket case. Fracture toughness tests on the unwelded base metal aged to 250,000 psi yield strength gave K sub Ic values in a range of 80,000 to 90,000 psi sq root in for the critical condition of resisting long surface cracks perpendicular to the rolling direction (simulating hoop stress in the rocket case). This indicated reasonably good fracture toughness at the yield stress level. A miniature tensile test in the thickness direction was used to supplement the bend test in studying delaminattion effects in the A sample. A laboratory homogenization anneal at 2100F improved K sub Ic values although the experimental procedure was not directly applicable to large plates. (Author)

**AD-465 780** **Field 11G, 13J, 13A**
**CFSTI Prices: HC$1.00 MF$0.50**
Navy Marine Engineering Lab., Annapolis, Md.
**EVALUATION OF LITHIUM HYDROXIDE FOR ALKALINITY CONTROL OF BOILER WATER SOFTENED WITH EDTA CHELATING AGENT,**
by E. H. Bolander. Jun 65, 20p MEL-209/65
Proj. S-R007-08-08,
Task 0613
Distribution: No limitation.

Descriptors: (*Feedwater, Boiler compounds), (*Boiler compounds, Lithium compounds), (*Corrosion inhibition, Boiler compounds), Boilers, Hydroxides, Sodium compounds, Complex compounds, Amines, Carboxlic acids, Scale, Water softeners, Additives, Chelate compounds.

An experimental boiler water treatment for 1200 psi boilers, using lithium hydroxide (LiOH) and the disodium salt of ethylenediaminetetraacetic acid, was evaluated in a series of 30-day studies in model boilers. This combination was found preferable to the present method (lowphosphate control treatment) or to a modification of the present method in which LiOH was substituted for NaOH for pH control (previously reported). When LiOH and NaOH were used independently, without other additives, LiOH was shown, by metallographic examination, to have superior corrosion inhibitive properties. When LiOH was combined with Na2EDTA and dilute seawater (0.5 epm chloride), slight corrosion was detected, but inhibition was superior to that exhibited by NaOH alone. This work is continuing. (Author)

**AD-465 999** **Field 11/D**
**CFSTI Prices: HC$4.00 MF$0.75**
Ohio River Div. Labs., Cincinnati.
**FIBROUS REINFORCEMENTS FOR PORTLAND CEMENT CONCRETE,**
by G. R. Williamson. May 65, 106p Technical rept. no. TR-2-40
Distribution: No limitation.

Descriptors: (*Concrete, Reinforcing materials), (*Reinforcing materials, Fibers (Synthetic), Glass textiles, Nylon, Steel, Wire, Composite materials, Mechanical properties, Deflection, Shock resistance, Impact shock, Compressive properties, Tensile properties, Elasticity, Shock waves.

Methods of increasing the flexural strength and shock resistance of concrete through the use of random fibrous reinforcements are presented. The materials used were various sizes and lengths of chopped steel wire, fiber glass, vinyl-coated fiber glass, and nylon. Only the nylon and steel wires proved effective. The results of static, flexural, and compressive tests are given, along with results of impact tests and tests conducted with high explosives. The fibres were tested in four different mixes: neat cement, No. 50 maximum size aggregate, No. 8 maximum size aggregate, and 3/8-inch

maximum size aggregate. It is shown that the 28-day ultimate flexural strength can be increased over 2.5 times that of plain concrete by the use of chopped steel wire as random reinforcement, and 1.5 times that of plain concrete with the use of a nylon monofilament. Nylon staples did not impart post-cracking strength to the concrete. The compressive strength is not affected by the nylon; however, an increase in strength of 1.5 times that of plain concrete can be realized from the use of chopped steel wire. Resistance to impact loads and to shock waves produced by impact are increased when the concrete is reinforced with either nylon or chopped wire. Random reinforced specimens did not spall even though subjected to more than five times the stress required to produce spalling in plain concrete.

**AD-466 120** **Field 11J, 7C**
**CFSTI Prices: HC$2.00 MF$0.50**
Reaction Motors Div., Thickol Chemical Corp., Denville, N. J.
**NITROSO RUBBER, RESEARCH, DEVELOPMENT AND PRODUCTION.**
Rept. 27 Feb-31 May 63,
by Marvin M. Fein. 31 May 63, 26p RMD-8576-Q1, Trenton-RD-343-Q1
Contract DA-19-129-AMC-69 (X),
Proj. QMC-7X93-15-004
N63 19886
Distribution: No limitation.

Descriptors: (*Synthetic rubber, Synthesis (Chemistry)), (*Fluorine compounds, Synthesis (Chemistry)), (*Organic nitrogen compounds, Synthesis (Chemistry)), Vulcanizates, Halogenated hydrocarbons, Nitrogen compounds, Oxygen compounds, Polymers, Copolymerization, Stability, Compatibility, Tensile properties, Pyrolysis, Transition temperature.

The preparation of trifluoroacetyl nitrite by the interaction of trifluoroacetic anhydride and dinitrogen trioxide has been effected by replicate, small scale batches. Exploratory solution pyrolyses of the nitrite indicate that decarboxylation occurs at temperatures of 145C or greater. Trifluoronitrosomethane was the major product. Small quantities of nitrosyl fluoride (FNO), for the synthesis of improved low temperature nitroso rubbers, were prepared by pyrolysis of nitrosyl tetrafluoroborate (NOBF4) and sodium fluoride at 250C. (Author)

**AI-TRANS-83** **Field 11F, 20M**
**CFSTI Prices: HC$1.00 MF$0.50**
Atomics International, Canoga Park, Calif.
**THE HEAT CAPACITY OF TANTALUM IN THE TEMPERATURE RANGE OF 1200 TO 2900 DEGREE K.**
by Ya. A. Kraftmakher. 1963, 8p
Translated from Z. Prikl. Mekhan. I Tekhn. Fiz., no. 2, 158-60 (1963). Distribution: No limitation.

Descriptors: (*Tantalum, Enthalpy), (*Enthalpy, Tantalum).

**ANL-6883** **Field 11F, 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Argonne National Lab., Ill.
**EXAMINATION OF IRRADIATED Ag-In-Cd ALLOYS,**
by C. F. Reinke. May 65, 18p
Contract W-31-109-eng-38
Distribution: No limitation.

Descriptors: (*Powder alloys, Radiation damage), (*Test reactors, Powder alloys), Silver alloys, Indium alloys, Cadmium alloys.

**ANL-7000** **Field 11F, 18J**
**CFSTI Prices: HC$7.00 MF$1.75**
Argonne National Lab., Ill.
**METALLURGY DIVISION ANNUAL PROGRESS REPORT FOR 1964.**
1965, 296p
Contract W-31-109-eng-38
Distribution: No limitation.

Descriptors: (*Fast reactors, Reactor fuel elements), (*Reactor fuel elements, Metallurgy).

**BNWL-SA-90** **Field 11F, 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**ELECTRON MICROSCOPE STUDIES OF SECOND PHASE PARTICLES IN DILUTE ALLOYS OF URANIUM,**
by B. Mastel, T. K. Bierlein, and C. L. Corey. 3 Mar 65, 11p CONF-650414-4
Contract AT (45-1)-1830
Presented at 19th Metallographic group meeting, Oak Ridge, Tenn. Distribution: No limitation.

Descriptors: (*Uranium alloys, Particle size), (*Electron microscopy, Uranium alloys).

**BNWL-32** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**THE STEADY-STATE CREEP OF HIGH-PURITY PLUTONIUM,**
by R. D. Nelson, T. K. Bierlein, and F. E. Bowman. Jan 65, 18p
Contract AT (45-1)-1830
Distribution: No limitation.

Descriptors: (*Plutonium, Creep), (*Creep, Plutonium).

**BNWL-33** **Field 11F, 18J**
**CFSTI Prices: HC$2.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**THE BETA-ALPHA AND ALPHA-BETA TRANSFORMATIONS IN PLUTONIUM UNDER APPLIED STRESSES,**
by R. D. Nelson, T. K. Bierlein, and F. E. Bowman. Jan 65, 35p
Contract AT (45-1)-1830
Distribution: No limitation.

Descriptors: (*Plutonium, Transformations), (*Transformations, Plutonium).

**C13.10-260-6** **Field 11F, 7C**
**CFSTI Price: MF$0.75**
National Bureau of Standards, Washington, D. C. Inst. for Materials Research.
**STANDARD REFERENCE MATERIALS: METHODS FOR THE CHEMICAL ANALYSIS OF WHITE CAST IRON STANDARDS,**
by J. I. Shultz. 16 Jul 65, 70p NBS-Misc-Publ-260-6
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.45.

Descriptors: (*Chemical analysis, Iron), (*Iron, Chemical analysis), Test methods, Standards, Reagents.

The procedures described are those used at the National Bureau of Standards in the analysis of white cast iron standard reference materials for the ten major elements; namely, carbon, manganese, phosphorus, sulfur, silicon, copper, nickel, chromium, vanadium, and molybdenum. Carbon and sulfur are determined by combustion; manganese, chromium and vanadium by titrimetry; phosphorus, copper, and molybdenum by photometry; and silicon and nickel by gravimetry. These procedures, which are slight modifications of well-established and previously published methods, were selected for their accuracy and dependability. (Author)

**CALT-221-10** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
W. M. Keck Lab. of Engineering Materials, California Inst. of Tech., Pasadena.
**METASTABLE AMORPHOUS FERROMAGNETIC PHASES IN PALLADIUM-BASE ALLOYS,**
by C. C. Tsuei and Pol Duwez. May 65, 5p
Contract AT (04-3)-221
Distribution: No limitation.

Descriptors: (*Palladium alloys, Ferromagnetic materials), (*Ferromagnetic materials, Palladium).

**CALT-221-8** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Keck (W.M.) Lab. of Engineering Materials, Calif. Inst. of Tech., Pasadena.
**THE STRUCTURE OF GAMMA PHASE IN THE NIOBIUMTIN SYSTEM,**
by T. R. Anantharaman. Mar 65, 8p
Contract AT (04-3)-221
Distribution: No limitation.

Descriptors: (*Phase studies, Niobium alloys), (*Niobium alloys, Tin alloys).

**CEND-532** **Field 11F, 18J, 18L**
**CFSTI Prices: HC$6.00 MF$1.50**
Combustion Engineering, Inc., Windsor, Conn. Nuclear Div.
**ADVANCED BONUS CORE DEVELOPMENT PROGRAM.**
Quarterly progress rept. no. 5, Dec 64-Feb 65,
by J. F. Gibbons, R. W. Knapp, and W. J. Mordarski, 17 May 65, 235p CEND-532
Contract AT (40-1)-3154
Distribution: No limitation.

Descriptors: (*Reactor cores, Power reactors), (*Reactor materials, Reactor cores).

**CNLM-4267** **Field 11F, 18J**
**CFSTI Prices: HC$2.00 MF$0.50**
Pratt and Whitney Aircraft, Middletown, Conn. Advanced Nuclear engineering Lab.
**CREEP RUPTURE DATA FOR C-1 Zr ALLOY,**
by J. B. Stewart and G. H. Rowe. 28 Sep 62, 31p
Contract AT (30-1)-2789
Distribution: No limitation.

Descriptors: (*Rupture, Reactor materials), (*Niobium alloys, Rupture), (*Zirconium alloys, Rupture).

**COO-1198-237** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Illinois Univ., Urbana. Dept. of Mining, Metallurgy, and Petroleum Engineering.
**FERROUS MARTENSITES,**
by C. M. Wayman. Jan. 65, 38p CONF-650537-1
Contracts AT (11-1)-1198, ARO-281
Prepared for presentation at Conference on the Physical Metallurgy of Balnite and Martensite, 10-12 May 1965. Scarborough, Eng. Distribution: No limitation.

Descriptors: (*Martensite, Crystallography), (*Metallography, Iron alloys).

**COO-578-P27-7** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
IIT Research Inst., Chicago, Ill. Technology Center.
**YIELD PHENOMENA AND FRACTURE OF HYDRIDED ZIRCONIUM.**
Quarterly rept. for 1 Jan 65 - 31 Mar 65,
by D. Weinstein. 30 Apr 65, 22p IITRI-B6035-7, EURAEC-1395
Contract AT (11-1)-578
Distribution: No limitation.

Descriptors: (*Zirconium, Hydrogen embrittlement), (*Fracture (Mechanics), Zirconium).

EURAEC-1295 Field 11F
CFSTI Prices: HC$2.00 MF$0.50
Brussels Univ. (Belgium).
**A STUDY OF SOME METAL OXIDATION PROBLEMS AND APPLICATION OF IMPEDANCE MEASUREMENT METHODS TO THE STUDY OF RESISTANCE TO CORROSION IN AN AQUEOUS MEDIUM.**
Final rept no. 2.
30 Sep 64, 26p
Contract 012-63-10-TEEB
Distribution: No limitation.

Descriptors: (*Oxidation, Metals), (*Corrosion, Liquids).

EURAEC-1296 Field 11F
CFSTI Prices: HC$1.00 MF$0.50
Ghent Rijksuniversiteit (Belgium). Metallurgical and Metallographic Lab.
**THE RUSTPROOF PLATING OF HEAVY-GAGE STEELS.**
Quarterly rept. no. 2, October 1-December 31, 1964,
by N. V. Neratoom and S. A. Soudmetal. 18 Jan 65, 11p EUR-2093
Contract 008-63-12 TEEB
Distribution: No limitation.

Descriptors: (*Steel, Corrosion inhibition).

EURAEC-1309 Field 11F
CFSTI Prices: HC$2.00 MF$0.50
Compagnie Des Ataliers et Forges de la Loire, Paris (France). Department de Recherches.
**A STUDY OF THE STRESS CORROSION BEHAVIOR OF STAINLESS STEELS.**
Quarterly rept. no. 1, Sep-Dec 64.
1964, 36p
Contract 033-64-9 TEE-F (RD)
Distribution: No limitation.

Descriptors: (*Stress corrosion, Stainless steel), (*Stainless steel, Stress corrosion).

EURAEC-1334 Field 11F
CFSTI Prices: HC$1.00 MF$0.50
Bologna Univ. (Italy). Istituto di Fisica.
**DIFFUSION AND PRECIPITATION MECHANISMS OF HYDROGEN IN ZIRCONIUM AND ITS ALLOYS.**
Quarterly rept no. 3, Sep 1-Nov 30, 64.
1964, 21p EUR-2311
Contract 026-64-3-TEE-I (RD)
Distribution: No limitation.

Descriptors: (*Hydrogen, Diffusion), (*Zirconium, Dispersion hardening), (*Zirconium alloys, Dispersion hardening).

EURAEC-1346 Field 11F
CFSTI Prices: HC$1.00 MF$0.50
Virginia Polytechnic Inst., Blacksburg. Dept. of Metals and Ceramic Engineering.
**THE RELATIONSHIP OF NITROGEN CONTENT OF AUSTENITIC STAINLESS STEELS TO STRESS CORROSION.**
Quarterly rept. no. 3,
by B. N. Ferry. Apr 65, 17p 438-3
Contract AT (40-1)-3208
Distribution: No limitation.

Descriptors: (*Stress corrosion, Stainless steel), (*Stainless steel, Austenite).

GEMP-346 Field 11F, 18J
CFSTI Prices: HC$3.00 MF$0.75
General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
**EVALUATION OF THE ZIRCALOYS FOR USE IN THE 630A REACTOR,**
by R. K. Betts. 26 Feb 65, 78p
Contract AT (40-1)-2847
Distribution: No limitation.

Descriptors: (*Zirconium alloys, Tin alloys), (*Reactor materials, Zirconium alloys).

Identifiers: Zircaloy.

N65-16977 Field 11F, 11G, 11I
CFSTI Prices: HC$1.00 MF$0.50
Rensselaer Polytechnic Inst., Troy, N. Y.
**INTERDISCIPLINARY MATERIALS RESEARCH CENTER,**
Semiannual progress rept. no. 5, 1 Mar-31 Aug 63.
25 Sep 63, 17p
Contract NSG 10060
NASA CR-52042
Distribution: No limitation.

Descriptors: (*Materials, Scientific research).

N65-17199 Field 11F
CFSTI Prices: HC$2.00 MF$0.50
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
**DEVELOPMENT OF DISPERSION STRENGTHENED TANTALUM BASE ALLOY.**
Quarterly progress rept. no. 4, 20 Aug-19 Nov 64,
by R. W. Buckman, Jr. 1964, 36p WANL-PR (Q)-005
Contract NAS3 2542
NASA CR-54288
Distribution: No limitation.

Descriptors: (*Tantalum alloys, Dispersion hardening).

N65-17219 Field 11F
CFSTI Prices: HC$1.00 MF$0.50
Hanford Atomic Products Operation, Richland, Wash.
**A STUDY OF TUNGSTEN-TECHNETIUM ALLOYS.**
Quarterly progress rept. for 1 Jul-1 Oct 64.
1 Oct 64, 14p Rept. no. HW-84309
Contract AT45 1 1350
NASA CR-60736
Distribution: No limitation.

Descriptors: (*Tungsten alloys, Technetium), (*Technetium, Tungsten alloys).

N65-17455 Field 11B
CFSTI Prices: HC$1.00 MF$0.50
Thompson Ramo Wooldridge, Inc., Cleveland, Ohio. TRW Equipment Lab.
**DETERMINATION OF ELEVATED-TEMPERATURE FATIGUE DATA ON REFRACTORY ALLOYS IN ULTRAHIGH VACUUM.**
Quarterly rept. no. 2, 1 Oct 64-1 Jan 65,
by C. R. Honeycutt and J. C. Sawyer. 12 Feb 65, 23p
Contract NAS3 6010
NASA CR-54286
Distribution: No limitation.

Descriptors: (*Refractory metal alloys, Fatigue (Mechanics)).

N65-17992 Field 11F
CFSTI Prices: HC$2.00 MF$0.50
General Electric Co., Cincinnati, Ohio. Space Power and Propulsion Section.
**STUDIES OF ALKALI METAL CORROSION ON MATERIALS FOR ADVANCED SPACE POWER SYSTEMS.**
Quarterly progress rept. no. 2, 26 Sep-6 Dec 64,
by R. W. Harrison. 1964, 38p
Contract NAS3-6012
NASA CR-54281
Distribution: No limitation.

Descriptors: (*Alkali metals, Corrosion), (*Refractory metal alloys, Potassium), (*Stainless steel, Niobium alloys).

N65-20487 Field 11D
CFSTI Prices: HC$5.00 MF$1.00
Electro-Optical Systems, Inc., Pasadena, Calif.
**DEVELOPMENT OF COMPOSITE IONIZER MATERIALS.**
Final rept.,
by M. LaChance, B. Thompson, H. Todd, and G. Kuskevics. 8 Apr 65, 152p EOS-4970
Contract NAS3-5248
NASA CR-54188
Distribution: No limitation.

Descriptors: (*Composite materials, Ionization).

N65-21626 Field 11F
CFSTI Prices: HC$3.00 MF$0.50
General Electric Co., Cincinnati, Ohio. Space Power and Propulsion Section.
**POTASSIUM CORROSION TEST LOOP DEVELOPMENT.**
Quarterly progress rept. no. 9, 15 Oct 64-15 Jan 65,
ed. by E. E. Hoffman. 12 Mar 65, 60p
Contract NAS3 2547
NASA CR-54344
Distribution: No limitation.

Descriptors: (*Refractory metal alloys, Potassium), (*Potassium, Boiling), (*Corrosion, Refractory metal alloys).

N65-21777 Field 11F
CFSTI Prices: HC$5.00 MF$1.00
Kaiser Aluminum and Chemical Corp., Spokane, Wash. Dept. of Metallurgical Research.
**INVESTIGATION OF WELDING AND FABRICABILITY OF KAISER EXPERIMENTAL ALLOY MR39A.**
Final rept., 1 Jul 62-30 Sep 63,
by F. R. Baysinger. 21 May 64, 178p Rept. no. MS-PR-64-12
Contract NAS8 5065,
Proj. 61783
NASA CR-62233
Distribution: No limitation.

Descriptors: (*Alloys, Mechanical properties).

N65-24846 Field 11G, 22B
CFSTI Prices: HC$1.00 MF$0.50
Emerson Electric of St. Louis, Mo. Electronics and Space Div.
**PERFORMANCE EVALUATION OF THERMO LAG MATERIAL FOR ENTRY HEAT PROTECTION OF ADVANCED MANNED SPACECRAFT. VOLUME ONE: SUMMARY OF INVESTIGATIONS.**
Final rept. 1 Oct 62-31 Jan 64.
28 Feb 64, 25p Rept. no. 1675
NASA CR-65015
Distribution: No limitation.

Descriptors: (*Manned spacecraft, Heat shields), (*Heat-resistant materials, Heat shields).

Identifiers: Thermo-lag.

N65-24847 Field 11G, 22B
CFSTI Prices: HC$7.00 MF$1.75
Emerson Electric of St. Louis, Mo. Electronics and Space Div.
**PERFORMANCE EVALUATION OF THERMO LAG MATERIAL FOR ENTRY HEAT PROTECTION OF ADVANCED MANNED SPACECRAFT. VOLUME TWO: THERMAL INVESTIGATIONS.**
Final rept. 1 Oct 62-31 Jan 64.
28 Feb 64, 319p Rept. no. 1675
NASA CR-65010
Microfilmed from best available copy. Distribution: No limitation.

Descriptors: (*Manned spacecraft, Heat shields), (*Heat-resistant materials, Heat shields).
Identifiers: Thermo-lag.

**N65-24848** **Field 11G, 22B**
**CFSTI Prices: HC$7.00 MF$2.00**
Emerson Electric of St. Louis, Mo. Electronics and Space Div.
**PERFORMANCE EVALUATION OF 'THERMO-LAG' MATERIAL FOR ENTRY HEAT PROTECTION OF ADVANCED MANNED SPACECRAFT. VOLUME THREE: STRUCTURAL INVESTIGATIONS.**
Final rept. 1 Oct 62-31 Jan 64.
28 Feb 64, 370p Rept. no. 1675
Contract NAS9 877
NASA CR-65024
Distribution: No limitation.

Descriptors: (*Manned spacecraft, Heat shields), (*Heat-resistant materials, Heat shields).

Identifiers: Thermo-lag.

**N65-25006** **Field 11C**
**CFSTI Prices: HC$2.00 MF$0.50**
General Electric Co., Schenectady, N. Y. Advanced Technology Labs.
**DEVELOPMENT OF LOW TEMPERATURE DIELECTRIC COATINGS FOR ELECTRICAL CONDUCTORS.**
Quarterly rept. no. 15,
by K. N. Mathes. 15 Apr 65, 33p
Contract NAS8-2442
NASA CR-62895
Distribution: No limitation.

Descriptors: (*Dielectrics, Coatings), (*Electric connectors, Coatings).

**N65-25249** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
TRW Equipment Labs., Cleveland, Ohio.
**GENERATION OF LONG TIME CREEP DATA ON REFRACTORY ALLOYS AT ELEVATED TEMPERATURES.**
Quarterly rept. no. 7, 26 Dec 64-26 Mar 65,
by J. C. Sawyer and C. H. Philleo. 28 Apr 65, 41p
Contract NAS3 2545
NASA CR-54393
Distribution: No limitation.

Descriptors: (*Creep, Refractory metal alloys), (*Refractory metal alloys, Creep).

**N65-25591** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle Memorial Inst., Columbus, Ohio.
**INVESTIGATION OF MECHANICAL PROPERTIES OF CHROMIUM, CHROMIUM-RHENIUM, AND DERIVED ALLOYS.**
Quarterly progress rept. no. 21,
by A. Gilbert and M. J. Klein. 30 Jun 65, 8p
Contract NASw-101
NASA CR-63249
Distribution: No limitation.

Descriptors: (*Chromium alloys, Mechanical properties), (*Rhenium alloys, Mechanical properties).

**N65-28852** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Denver Research Inst., Colo.
**THEORETICAL STUDIES ON THE RELATIONSHIP BETWEEN THE THERMIONIC WORK FUNCTION OF REFRACTORY INTERMETALLIC COMPOUNDS AND THEIR ELECTRONIC AND CRYSTAL STRUCTURES.**
Progress rept ltr, 1 Jul-31 Dec 64,
by C. Samuel Miller and Jerry D. Plunkett. 31 Dec 64, 4p
Grant NsG-365
NASA CR-63840
Distribution: No limitation.

Descriptors: (*Intermetallic compounds, Work functions), (*Refractory materials, Physical properties).

**N65-32184** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**INFLUENCE OF ORDER-DISORDER TRANSFORMATION ON FRICTION CHARACTERISTICS OF COPPER-GOLD ALLOYS IN VACUUM,**
by Donald H. Buckley. Sep 65, 11p NASA-TN-D-2985
Distribution: No limitation.

Descriptors: (*Copper alloys, Friction), (*Gold alloys, Friction).

**N65-32648** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**TUNGSTEN-NICKEL-COPPER TERNARY ALLOYS FOR HIGH-TEMPERATURE APPLICATIONS,**
by Ruluff D. McIntyre. Sep 65, 23p
NASA TND-3015
Distribution: No limitation.

Descriptors: (*Tungsten alloys, Sintering), (*Sintering, Tungsten alloys), Nickel alloys, Copper alloys.

**N65-33838** **Field 11F, 11B**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**HYPERVELOCITY IMPACT DAMAGE CHARACTERISTICS IN BERYLLIUM AND GRAPHITE PLATES AND TUBES,**
by James H. Diedrich, Irvin J. Loeffler, and A. R. McMillan. Sep 65, 30p
NASA TND-3018
Distribution: No limitation.

Descriptors: (*Beryllium, Impact shock), (*Graphite, Impact shock), (*Damage, Hypervelocity projectiles).

**N65-34221** **Field 11H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**VAPOR-DEPOSITED THIN GOLD FILMS AS LUBRICANTS IN VACUUM (10 TO THE MINUS 11TH POWER mm Hg),**
by Talivaldis Spalvins and Donald H. Buckley. Oct 65, 15p
NASA TND-3040
Distribution: No limitation.

Descriptors: (*Lubricants, Metal films), (*Gold, Metal films).

**N65-34502** **Field 11B**
**CFSTI Prices: HC$5.00 MF$1.00**
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
**THERMOPHYSICAL PROPERTIES OF SIX CHARRING ABLATORS FROM 140 TO 700K AND TWO CHARS FROM 800 TO 3000K,**
by R. Gale Wilson. Oct 65, 145p
NASA TND-2991
Distribution: No limitation.

Descriptors: (*Heat shields, Thermal properties), (*Reentry vehicles, Ablation).

**OTR-131** **Field 11C, 11F**
National Bureau of Standards, Washington, D. C. Inst. for Applied Technology.
**HIGH TEMPERATURE PROTECTIVE COATINGS FOR MOLYBDENUM AND TUNGSTEN.**
Nov 65, 22p
Prepared in cooperation with Clyde Williams and Co., Columbus, Ohio. Distribution: No limitation. Available free from the Clearinghouse.

Descriptors: (*Molybdenum, Coatings), (*Tungsten, Coatings), (*Coatings, Refractory metals), Reviews, Abstracts, Bibliographies, Corrosion inhibition, Oxidation, Niobium, Tantalum, High-temperature research, Refractory metal alloys, Composite materials, Ceramic materials, Refractory materials, Ceramic coatings, Protective treatments.

Significant reports covering the period from 1960 were selected for this study with reference to earlier works. Recent Government-sponsored research runs the gamut from fundamental studies on the breakdown mechanisms of protective coatings as temperatures increase, to the testing of commercially available coatings. Protective coatings are available which function properly under specific circumstances; however, to date, durable protective coatings for ultra-high temperatures are not commercially available. The need is great, but in spite of voluminous work in this area, no panacea has yet been discovered. (Author)

**OTR-132** **Field 11A**
National Bureau of Standards, Washington, D. C. Inst. for Applied Technology.
**HIGH TEMPERATURE ADHESIVES ABOVE 500F.**
Nov 65, 16p
Prepared in cooperation with Westinghouse Electric Corp., Baltimore, Md. Available free from the Clearinghouse. Distribution: No limitation.

Descriptors: (*Adhesives, Heat-resistant materials), Bonding, Bonded joints, Ceramic materials, Heatresistant plastics, Sealing compounds, Reviews, Bibliographies, Abstracts, Metals, Laminates, Plastics, Sandwich construction, Composite materials, Degradation.

Significant reports covering the period since 1958 were selected for this study. The search extended up through the 20 June 1965 issue of the US Government Research and Development Reports (USGRDR). High temperature adhesives are utilized in various industrial applications. Adhesive bonded structural members for aircraft, electrically insulated hermetic seals for electronic tubes and modules, and automobile sparkplug seals are examples of some of these applications. Ceramic materials excel in thermal endurance at high temperatures (1000F to 3000F). However, at any temperature below the 'softening' point a characteristic lack of elasticity, or brittleness, may become a problem for some applications. Programs are underway for upgrading performance limitations, such as those related to joint designs, bonding processes, and compatibility of substrate thermal expansion coefficients. Organic adhesives usually possess desirable handling and manufacturing characteristics. The toughness and resistance to shock from sub-zero through room ambient temperatures is reasonably satisfactory. Materials are being synthesized which yield a significant magnitude of strength when tested at 500 F and after exposures of from 1 to 500 hours at 500 F. At the present state of the art, deterioration is rapid at 1000 F; however, certain adhesives do exhibit a minimal strength after 10 minutes exposure at this temperature. (Author)

**OTR-133** **Field 11C**
National Bureau of Standards, Washington, D. C. Inst. for Applied Technology.
**THIN FILM PROTECTIVE COATINGS.**
Nov 65, 12p
Prepared in cooperation with Association of American Railroads, Research Center, Chicago, Ill. Available free from the Clearinghouse. Distribution: No limitation.

Descriptors: (*Films, Protective treatments), (*Metals, Films), (*Corrosion inhibition, Coatings), Reviews, Abstracts, Bibliographies, Oxides, Corrosion, Electrolysis, Phosphate

coatings, Organic coatings, Anodic coatings, Electrodeposition, Aluminum, Lubrication.

Significant reports covering the period since 1962 were selected for this study, with reference to relevant earlier works. Studies on protective black oxide coatings applied at low temperature; corrosion, corrosion inhibition, and galvanic corrosion have been included. Recent government R and D on moderate temperature nonmetallic protective coatings has resulted in the development of thin surface coatings for use on ferrous and other metal surfaces. Zinc phosphate undercoats have shown up well against iron and manganese phosphates. The flow of sodium ions through films has helped in studying organic barrier films for corrosion control while exposed to salt water. Various newer types of protective films also include oxide and other chemical conversion types, organic, organic electrodeposited, and painted films. These films usually have the effect of controlling corrosion as an addition to the environment or as a protective coating on the metal. Some of the thin protective films have flaws in their manner of application and are not as effective as desired. Recent research on the above coatings have led to the development of films which, while affording a high degree of protection to metal, do not interfere with normal or dry-film lubrication. (Author)

**Patent 3,216,945** **Field 11C**
**PAINT REMOVER FOR NON-FERROUS METAL PARTS.**
Patent assigned to Army,
by Abraham Mankowich. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Paint removers, Alkaline earth compounds), (*Alkaline earth compounds, Paint removers), Sodium compounds, Hydrates, Phosphates, Hydroxides, Laurates, Ethanols, Amines, Glycols, Silicates, Patents.

Identifiers: Diethanols amines, Hexane triols, Sodium phosphates, Sodium silicate.

The paint stripping composition contains 13 to 20 percent (by weight) of sodium metasilicate pentahydrate, 18-27 percent of trisodium phosphate dodecohydrate, 4 to 7 percent of sodium biphosphate monohydrate, 1.7 to 2.5 percent of lauric acid, 0.2 to 0.3 of sodium hydroxide, up to 10 percent diethanolamine and 43 to 56 percent of 1,2,6-hexanetriol.

**Patent 3,217,003** **Field 11I, 7C**
**METHOD FOR PREPARING TRIARYL ISOCYANURATES.**
Patent assigned to Agriculture,
by Samuel E. Ellzey, Jr. and Charles H. Mack. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Isocyanate plastics, Preparation), Polymerization, Catalysis, Hydrides, Aluminum compounds, Lithium compounds, Borohydrides, Synthesis (Chemistry), Patents.

Identifiers: Isocyanurates.

Triaryl isocyanurates and substituted triaryl isocyanurates find utility in the polymer art. The process includes the steps of reacting together an aryl isocyanate or a substituted aryl isocyanate and catalytic amounts of an alkali metal borohydride, an alkali metal aluminum hydride, or an alkali metal trialkoxyaluminohydride in an inert organic liquid medium suitable for bringing about mutual solubility of the reactants or without such liquid medium, at a temperature not to exceed 115 degrees C., and recovering the triaryl isocyanurate or substituted triaryl isocyanurate by conventional dilution and filtration procedures.

**PB-168 649** **Field 11C**
**CFSTI Prices: HC$2.00 MF$0.50**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**OPTICAL COATINGS, A REPORT BIBLIOGRAPHY.**
Dec 65, 37p
Distribution: No limitation.

Descriptors: (*Optical coatings, Bibliographies), (*Bibliographies, Optical coatings), Reports, Abstracts, Subject indexing.

**PB-168 650** **Field 11I**
**CFSTI Prices: HC$2.00 MF$0.50**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**THERMOPLASTICS, A REPORT BIBLIOGRAPHY.**
Dec 65, 41p
Distribution: No limitation.

Descriptors: (*Thermoplastics, Bibliographies), (*Bibliographies, Thermoplastics), Reports, Abstracts, Subject indexing.

**PB-168 651** **Field 11I**
**CFSTI Prices: HC$2.00 MF$0.50**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**THERMOSETTING PLASTICS, A REPORT BIBLIOGRAPHY.**
Dec 65, 50p
Distribution: No limitation.

Descriptors: (*Thermosetting plastics, Bibliographies), Reports, Abstracts, Subject indexing.

**PB-168 652** **Field 11I**
**CFSTI Prices: HC$3.00 MF$0.75**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**EXPANDED PLASTICS, A REPORT BIBLIOGRAPHY.**
Dec 65, 100p
Distribution: No limitation.

Descriptors: (*Expanded plastics, Bibliographies), (*Bibliographies, Expanded plastics), Reports, Abstracts, Subject indexing, Plastics.

**PB-168 653** **Field 11I**
**CFSTI Prices: HC$2.00 MF$0.50**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**EMBEDDING SUBSTANCES, A REPORT BIBLIOGRAPHY.**
Dec 65, 41p
Distribution: No limitation.

Descriptors: (*Embedding substances, Bibliographies), Plastics, Reports, Abstracts, Subject indexing.

**PB-168 654** **Field 11C**
**CFSTI Prices: HC$4.00 MF$0.75**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**PLASTIC COATINGS, A REPORT BIBLIOGRAPHY.**
Dec 65, 124p
Distribution: No limitation.

Descriptors: (*Plastic coatings, Bibliographies), Abstracts, Subject indexing.

**PB-168 655** **Field 11I**
**CFSTI Prices: HC$3.00 MF$0.75**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**LAMINATED PLASTICS, A REPORT BIBLIOGRAPHY.**
Dec 65, 92p
Distribution: No limitation.

Descriptors: (*Laminated plastics, Bibliographies), Abstracts, Subject indexing.

**PB-168 656** **Field 11I**
**CFSTI Prices: HC$5.00 MF$1.00**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**HEAT RESISTANT PLASTICS, A REPORT BIBLIOGRAPHY.**
Dec 65, 210p
Distribution: No limitation.

Descriptors: (*Heat-resistant plastics, Bibliographies), Abstracts, Subject indexing.

**PB-168 673** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Naval Engineering Experiment Station, Annapolis, Md.
**MAGNETIC CHARACTERISTICS OF 'NON-MAGNETIC' MATERIALS; COMPARISON OF PROPERTIES IN STRONG AND WEAK FIELDS,**
by M. R. Gross. 13 Nov 51, 26p EES-4E
(2)66904; 4P (2)66918
Projs. NS-011-083; NS-013-118
Distribution: No limitation.

Descriptors: (*Alloys, Magnetic properties), Brass, Bronze, Copper alloys, Nickel alloys, Castings, Austenite, Stainless steel, Manganese alloys, Electric fields, Permeability, Dispersion hardening.

The report investigates the magnetic properties of 'non-magnetic' or feebly magnetic metallic materials. The report contains both weak and strong field magnetic data on a wide variety of materials such as brasses, bronzes, cupronickel alloys, nickel-base alloys, wrought and cast austenitic stainless steels, austenitic stainless steel weld metal, precipitation hardening stainless steels, and austenitic manganese steels. Tabulations include strong field normal permeability and coercive force measurements, weak field normal and 'ideal' permeability measurements, and normal permeability at various temperatures. In addition to conclusions relative to the correlation of test results, the report contains generalizations in the form of recommendations as to the expected magnetic behavior of the various types of materials. (Author)

**PB-168 687** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval Engineering Experiment Station, Annapolis, Md.
**ENDURANCE AND STRESSLESS CORROSION FATIGUE TESTS OF Ni-Cu ALLOYS AND TOBIN BRONZE IN SEA WATER.**
Research and development rept.,
by H. C. Ellinghausen. 15 Apr 57, 16p EES-040037F (7)
Proj. NS-013-118
AD 139 978
Distribution: No limitation.

Descriptors: (*Nickel alloys, Copper alloys), (*Corrosion-resistant alloys, Liquid immersion tests), (*Corrosion, Fatigue (Mechanics)), (*Bronze, Fatigue (Mechanics)), Sea water.

Identifiers: Constantan, Monel (alloys).

Results of endurance and stressless corrosion fatigue tests are reported for Monel metal, 45-55 Ni-Cu alloy (constantan), 'K' Monel and Tobin bronze. These materials were tested as 1.5 in. diameter rotating beam specimens in the Station's MAN fatigue testing machine. Prior corrosion was carried out with the specimens completely submerged in slowly moving sea water for periods of 60 and 390 days. Monel metal was tested in the cold-drawn condition after annealing at 575 and 1000 F, and in the hot-rolled condition. Specimens were tested in the polished condition, with the surface oxidized, and as smooth machined. Materials, other than Monel, were tested in one condition only. The fatigue properties obtained for Monel were somewhat lower than were obtained pre-

viously with similar material tested as standard rotating cantilever specimens. Similar behavior was noted for K Monel. Test results obtained for constantan and Tobin bronze compared favorably with results obtained with similar materials using rotating cantilever specimens. (Author)

**PB-168 688** **Field 11B**
**CFSTI Prices: HC$3.00 MF$0.50**
Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
**PYROLYTIC GRAPHITE AND CARBON, A REPORT BIBLIOGRAPHY.**
Dec 65, 60p
Distribution: No limitation.

Descriptors: (*Pyrolytic graphite, Bibliographies), (*Carbon, Bibliographies), Abstracts, Subject indexing.

**PB-168 761** **Field 11F**
**CFSTI Prices: HC$4.00 MF$0.75**
Armour Research Foundation, Chicago, Ill.
**PHASE RELATIONSHIPS IN MAGNESIUM-LITHIUMALUMINUM AND MAGNESIUM-LITHIUM-ZINC ALLOYS.**
Final rept., 30 Apr 53-1 Jul 54.
15 Sep 54, 103p
Contract DA-11-022-ORD-906,
Proj. ARF-B-043
AD 44 256
Distribution: No limitation.

Descriptors: (*Magnesium alloys, Phase studies), (*Lithium alloys, Phase studies), (*Aluminum alloys, Phase studies), (*Zinc alloys, Phase studies), Metallography, X-ray diffraction analysis, Thermal analysis.

A study was made of equilibrium phase relationships in the systems magnesium-lithium-aluminum and magnesium-lithium-zinc using the methods of metallographic analysis, x-ray diffraction, and thermal analysis. Four partial isotherms are presented for each system for 400, 300, 200 and 100 C. In addition several appropriate vertical sections are constructed for each system. The structure of the ternary MgLiA12 phase was determined, as was the compositional range of existence of the ternary 0 (MgLiZn) phase. The four-phase peritectic type reaction Liq + theta reversibly yields beta + delta (LiZn) was found in the magnesium-lithium-zinc system at a temperature of 317 ± 2 C. Neither the MgLi2A1 nor the MgLi2Zn phases previously reported to exist in these systems are equilibrium phases. There is evidence that they may exist as transition phases. (Author)

**PB-168 772** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**ETUDE DE LA DIFUSION DU FER, DE L'ARGENT ET DU CARBONE DANS LE BERYLLIUM AU MOYEN DES TRACEURS RADIOACTIFS (STUDY OF THE DIFFUSION OF IRON, OF SILVER AND OF CARBON IN BERYLLIUM USING RADIOACTIVE TRACERS).**
Doctoral thesis in French,
by Naik Mool Chandra. 29 Jun 64, 46p CEA-R-2621
Text in French; Attached Summary in English.
Distribution: No limitation.

Descriptors: (*Beryllium, Diffusion), (*Iron, Diffusion), (*Silver, Diffusion), (*Carbon, Diffusion), (*Diffusion, Tracer studies), France, Differential equations, Anisotropy, Autoradiography.

A study was made of the diffusion of radio-active iron and silver travers in beryllium. The values for iron are in good agreement with those found previously for chemical diffusion. A comparison of the diffusion coefficients for iron, silver and nickel shows that the diffusion rate increase with increasing solute atom radius. The existence has been shown of diffusion anisotropy for silver; it has been studied quantitatively on monocrystals. The anisotropy decreases as the temperature increases. The silver diffuses more rapidly along the C axis than in the base plane. This result cannot be explained in terms of the model proposed for the diffusion of foreign atoms in solution in zinc. A greater number of experiments is required before a model can be put forward. An attempt has also been made to determine the diffusion coefficients of carbon in beryllium by treatment in an atmosphere of acetylene marked with C-14. Diffusion coefficients have been obtained but these should not be considered to be very significant since a chemical reaction occurs of the surface of the samples.

**PB-168 812** **Field 11F, 8I**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR JANUARY 1965.**
15 Feb 65, 10p
Distribution: No limitation. Subcontracted to Battelle Memorial Inst., Columbus, Ohio.

Descriptors: (*Steel, Fracture (Mechanics)), (*Fracture (Mechanics), Steel), Drilling, Pipes, Cutting fluids, Sea water, Fatigue (Mechanics), Environmental tests.

This letter report, with tables and figures, presents the experimental results of crack propagation tests conducted in unagitated seawater at 60 cpm. These tests showed a significant decrease in crack initiation time, and a significant increase in crack propagation rate as compared to similar data obtained in air. The tests also indicated that optical means are satisfactory for observation of crack growth in seawater, but that observation of crack growth rates in drilling mud will require an alternate means. (Author)

**PB-168 813** **Field 11F, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR MARCH 1965.**
15 Apr 65, 9p
Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 814. Distribution: No limitation.

Descriptors: (*Corrosion, Steel), (*Pipes, Fatigue (Mechanics)), (*Fatigue (Mechanics), Corrosion), (*Steel, Fatigue (Mechanics)), Drilling, Cutting fluids, Coatings, Corrosion inhibition, Zinc coatings, Electroplating, Sea water, Liquid immersion tests, Oxygen.

Identifiers: Drill pipes, Mohole project, Steel 6427.

Two principal areas were investigated for alleviation of the corrosion fatigue problem for the 135 type steels. These areas are in the treatment of the drilling fluid and in the coating of the drill pipe material. In an evaluation of the former, an attempt has been made to deaerate the seawater and observe the effect of the lower oxygen content. The results of this are inconclusive. In carrying out the latter investigation, the report presents the effects of zinc electroplating on the fatigue behavior of 135 type steel in seawater. The results presented in this report indicate that substantial improvement in fatigue behavior of this steel can be attained by the zinc electroplate process. (Author)

**PB-168 814** **Field 11F, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR APRIL 1965.**
19 May 65, 11p
Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 815. Distribution: No limitation.

Descriptors: (*Corrosion, Steel), (*Pipes, Fatigue (Mechanics)), (*Fatigue (Mechanics), Corrosion), (*Steel, Fatigue (Mechanics)), Drilling, Cutting fluids, Coatings, Corrosion inhibition, Zinc coatings, Electroplating, Sea water, Liquid immersion tests, Oxygen.

Identifiers: Drill pipes, Mohole project, Steel 6427.

The results of the unplated specimens tested in deaerated seawater indicated that either the deaeration was ineffective or oxygen was being picked up during the course of the fatigue test. Consequently, the oxygen level was checked on several samples of deaerated seawater and, as a result of these tests, it was concluded that the method of circulation of the seawater is unsatisfactory. After equipment modifications are made, further tests will be conducted. The study on the effect of zinc electroplating has progressed, and results of the tests to date are tabulated and plotted in this progress report. These results indicate that substantial improvement of the fatigue behavior of 135-type drill pipe steel is achieved by electroplating with zinc. Tables and plots showing results of the tests on specimens containing holidays (with holiday sizes and locations indicated) are also included. All tests were conducted at 115-ksi maximum stress, 75-ksi mean stress, and 60 cpm. Failure of the specimen with the 1/2-in. holiday occurred in the center of the unplated portion after 428,000 cycles. This result would tend to indicate that protection is partly lost at this size holiday. Additional tests are planned. (Author)

**PB-168 815** **Field 11F, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR JUNE 1965.**
2 Jul 65, 11p
Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 816. Distribution: No limitation.

Descriptors: (*Corrosion, Steel), (*Pipes, Fatigue (Mechanics)), (*Fatigue (Mechanics), Corrosion), (*Steel, Fatigue (Mechanics)), Drilling, Impact shock, Shock resistance, Sea water, Liquid immersion tests, Oxygen, Deformation.

Identifiers: Drill pipes, Mohole project, Steel 6427.

Attention was directed toward completing the corrosion fatigue study using deaerated seawater, determining the impact properties of M-135 steel at 0F, and performing flattening trials on the sections to be used to fabricate the plate specimens for the fatigue crack propagation and fracture studies. Results of early studies on corrosion fatigue indicated that either deaeration was ineffective as a means of improving the corrosion fatigue behavior of the specimen or the water was picking up oxygen during the experiments. Therefore, in the series of studies reported upon here, steps were taken to modify the seawater circulating system to ensure that no oxygen would leak into the system. Results of the tests clearly demonstrate that the fatigue life of the 135-type steel tested in seawater is not improved by removal of oxygen to a level below 0.1 ppm. Results of impact tests performed on M-135 steel at 0F indicate that the impact energy values achieved in the specimens which were tempered at 1200F will meet the values called out in the specifications. However, the specimens which were tempered at 1150F did not exhibit Charpy energy values which would satisfy the specifications. It appears that the energy values achieved are not plateau values; i.e., 0F may be approaching the transition temperature. In the flattening experiments, sections were cut from M-135 steel pipe, and the sections were then heated and flattened. (Author)

**PB-168 816** **Field 11F, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR JULY 1965.**
10 Aug 65, 4p
Subcontracted to Battelle Memorial Inst., Columbus, Ohio. See also PB-168 817. Distribution: No limitation.

Descriptors: (*Fatigue (Mechanics), Corrosion), (*Corrosion, Steel), (*Pipes, Fatigue (Mechanics)), (*Steel, Fatigue (Mechanics)), Drilling, Zinc coatings, Coatings, Corrosion inhibition, Seawater, Liquid immersion tests.



799-657 O - 66 - 18

Identifiers: Drill pipes, Mohole project, Steel 6427.

The report concerns fatigue and corrosion-fatigue studies on zinc-coated and bare specimens of 135-type steel. One result of these tests is the apparent detrimental effect of electroplating per se to the fatigue life of 135-type steel. Hydrogen studies have been completed and will be reported upon in the next progress report. Charpy V-notch impact test specimens are being prepared for the test program to establish the impact energy curves of fulland 2/3-size specimens of AMS 6427C- (M-135) steel. In crack propagation studies, the specimens to be used for studying the influence of tempering temperature on the fatigue crack propagation behavior of the M-135 steel are in the final machining stages. Testing should be completed very soon. (Author)

**PB-168 817** **Field 11F, 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown and Root, Inc., Houston, Tex.
**PROGRESS REPORT FOR AUGUST 1965.**
16 Sep 65, 9p
Subcontracted to Battelle Memorial Inst., Columbus, Ohio. Distribution: No limitation.

Descriptors: (*Steel, Fatigue (Mechanics)), (*Corrosion, Steel), (*Pipes, Fatigue (Mechanics)), (*Fatigue (Mechanics), Corrosion), Hydrogen embrittlement, Zinc coatings, Coatings, Corrosion inhibition, Seawater, Liquid immersion tests, Tensile properties, Cutting fluids, Drilling, Fracture (Mechanics), Electroplating, Shock resistance, Tempering.

Identifiers: Mohole project, Drill pipes, Steel 6427.

In hydrogen studies, both zinc-electroplated and unplated specimens of AMS 6427 steel were loaded to a stress of 135,000 psi (based on the notched cross section) and exposed to flowing, fresh seawater for over 500 hours. None of the specimens failed during the predetermined runout time for the exposure tests. Subsequent tests in a tensile machine after baking to remove hydrogen did not reveal any significant hydrogen damage. The evaluation of the Charpy V-notch impact behavior of the M-135 steel tempered at 1150F and 1200F was completed during August. The impact energy values at 0F of the material which was tempered at 1150F are below the values called out in the specifications. Consequently, if the values in the specifications are taken as firm values, the 1150F temper will not be suitable. Additional experimental work on the evaluation of the fatigue behavior of the 135-type steel in the drilling muds was undertaken during August. To aid in the evaluation of the fatigue results, biological assays were performed upon receipt of the drilling fluids and regularly thereafter. A check was made for the presence of sulfate-reducing bacteria according to API procedure. Crack propagation tests to determine the influence of tempering temperature on the fatigue crack propagation behavior of M-135 steel have been completed. The data show that the specimens which were tempered at 1200F possess better fatigue crack propagation characteristics than those which were tempered at 1150F. (Author)

**PB-168 849** **Field 11F, 21H, 21E**
**CFSTI Prices: HC$3.00 MF$0.75**
RAND Corp., Santa Monica, Calif.
**SHORT-TIME, HIGH-TEMPERATURE PROPERTIES OF HEAT-RESISTING ALLOY SHEET,**
by W. F. Simmons, J. A. VanEcho, and H. C. Cross. Jun 49, 91p R-147
Proj. USAF-RR-1
ATI 65 076
Distribution: No limitation. Prepared in cooperation with Battelle Memorial Inst., Columbus, Ohio.

Descriptors: (*Sheets, Heat-resistant metal + alloys), (*Heat-resistant metals + alloys, Sheets), Thermal properties, Tensile properties, Creep strength, High-temperature research, Magnesium alloys, Aluminum alloys, Iron, Steel, Chromium alloys, Nickel alloys, Silicon alloys, Iron alloys, Cobalt alloys, Tungsten alloys, Molybdenum alloys, Niobium alloys, Deformation, Rocket motors, Jet engines.

Identifiers: Steel 4130, Inconel (Alloys), Inconel X (Alloy), Hastelloy C (Alloy), Stellite 21 (Alloy).

The results of a laboratory evaluation program on short-time high-temperature tension and creep properties of a wide variety of sheet materials now commercially available are reported. These materials ranged from magnesium- and aluminum-base alloys in the lower temperature ranges to the strongest heat-resisting alloys available for high-temperature service. Data are reported for two magnesium alloys, two aluminum alloys, Armco ingot iron, annealed and heat-treated SAE 4130 steel, 18Cr-8Ni steel of several grades, 25Cr-20Ni-2Si alloy, Inconel, Inconel 'X,'Hastelloy C, and Stellite 21. Tests were made at appropriate temperatures ranging from 300 to 2000 F for the various materials. The shorttime tensile data indicate that Stellite 21 alloy is one of the highest strength sheet materials over the temperature range of room temperature to 1800 F. Cold-rolled and quenched 18Cr-8Ni + Cb and tempered SAE 4130 steel have high tensile and yield strengths up to the medium temperature range (800 to 1200 F). At temperatures above 1300 F, Stellite 21 and Hastelloy C alloys are superior in both tensile and yield strengths. Aluminum alloy 75S-T had the highest tensile and yield strengths of the light alloys tested at room temperature and 400 F.

## 12. MATHEMATICAL SCIENCES

**BNL-8110** **Field 12A**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**SOME PROBLEMS IN NUMERICAL ANALYTICAL CONTINUATION,**
by J. R. Cannon and Keith Miller. 1963, 25p
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Numerical analysis, Complex variables), (*Complex variables, Numerical analysis).

**BNL-8185** **Field 12A, 20M**
**CFSTI Prices: HC$2.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**NUMERICAL CONTINUATION BACKWARDS IN TIME FOR SOLUTIONS OF THE HEAT EQUATION AND NUMERICAL CONTINUATION OF SOLUTIONS OF LAPLACES EQUATION IN A HALF-SPACE,**
by J. R. Cannon. 1964, 28p
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Numerical analysis, Partial differential equations).

**C13.46:224** **Field 12A, 20N, 20F**
**CFSTI Prices: HC$0.20 MF$0.50**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**COMPUTATION OF A MODIFIED FRESNEL INTEGRAL ARISING IN THE THEORY OF DIFFRACTION BY A VARIABLE SCREEN.**
Technical note,
by L. C. Walters and J. R. Wait. 14 Oct 64, 24p
NBS-TN-224
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.20.

Descriptors: (*Integrals, Wave functions), (*Wave functions, Diffraction), (*Diffraction, Wave functions), Radio transmission, Light transmission.

**C13.46:250** **Field 12A**
**CFSTI Prices: HC$0.15 MF$0.50**
National Bureau of Standards, Washington, D. C.
**A NOMOGRAM FOR COMPUTING a + jbb/c + jd AND A NOMOGRAM FOR COMPUTING ABSOLUTE VALUE a + jb/c + jd.**
Technical note,
by Howard S. Bowman. 2 Oct 64, 17p NBS-TN-250
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.15.

Descriptors: (*Nomographs, Vector analysis), (*Vector analysis, Nomographs), Algorithms, Numerical methods + procedures, Medical research.

This report gives two nomograms designed and constructed for use in computing complex ratios of two dimensional vector quantities. One nomogram can be used to compute the real and imaginary parts of a vector ratio, and the other to compute the absolute value of such a function. Whenever a large number of vector ratios are required in data reduction, the use of these nomograms saves time in manual processing. (Author)

**N65-16830** **Field 12A**
**CFSTI Prices: HC$2.00 MF$0.50**
Seton Hall Univ., Jersey City, N. J.
**THE EXPLICIT SOLUTION OF THE ANALYTIC N-BODY PROBLEM,**
by L. M. Rauch. 1965, 33p
Grant NsG413
NASA CR-53213
Distribution: No limitation.

Descriptors: (*N-body problem, Mathematical analysis).

**N65-16988** **Field 12A, 20K**
**CFSTI Prices: HC$2.00 MF$0.50**
California Univ., Berkeley. Space Sciences Lab.
**THE THREE BODY PROBLEM,**
by C. G. Lemaitre. 20 Aug 63, 48p
Grants NSG-243-62, NSG-122-61
NASA CR-51986
Distribution: No limitation.

Descriptors: (*N-body problem, Hamiltonian), (*Hamiltonian, N-body problem).

**N65-17946** **Field 12B**
**CFSTI Prices: HC$3.00 MF$0.50**
California Univ., Berkeley. Space Sciences Lab.
**A COMPARISON AMONG EIGHT KNOWN OPTIMIZING PROCEDURES.**
Internal working paper no. 20,
by A. Leon. Aug 64, 52p
Grant NSG-243-62
NASA CR-60952
Distribution: No limitation.

Descriptors: (*Optimization, Numerical methods + procedures).

**N65-19957** **Field 12A**
**CFSTI Prices: HC$1.00 MF$0.50**
Emory Univ., Atlanta, Ga.
**THE GAMMA FUNCTION WITH VARYING DIFFERENCE INTERVAL,**
by Tomlinson Fort. Sep 64, 16p
Grant NsG545
NASA CR-59378
Distribution: No limitation. Microfilmed from best available copy.

Descriptors: (*Special functions (Mathematics), Functional analysis), (*Functional analysis, Special functions (Mathematics)).

**N65-20106** **Field 12A**
**CFSTI Prices: HC$6.00 MF$1.50**
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.

**STUDY OF METHODS FOR THE NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS.**
Final rept., 9 Nov 63-8 Nov 64,
by H. L. Durham, Jr., O. B. Francis, Jr., L. J. Gallaher, H. G. Hale, Jr., and I. E. Perlin. 8 Nov 64, 289p
Contract NAS8-11129,
Proj. A-740
NASA CR-57430
Microfilmed from best available copy. Distribution: No limitation.

Descriptors: (*Differential equations, Numerical analysis).

**N65-21778** **Field 12A**
**CFSTI Prices: HC$2.00 MF$0.50**
Maryland Univ., College Park. Computer Science Center.
**ON A GENERAL ESTIMATION PRINCIPLE AND A THEORY OF COMPARISON-FACTORS.**
Technical rept.,
by Werner C. Rheinboldt. Feb 65, 43p Technical rept. TR-65-14
Grants NsG938, D-31-124-G563
NASA CR-62262
Distribution: No limitation.

Descriptors: (*Mathematical prediction, Factor analysis).

**N65-22132** **Field 12A**
**CFSTI Prices: HC$3.00 MF$0.50**
Florida Univ., Gainesville. Quantum Theory Proj.
**STUDIES IN PERTURBATION THEORY. X. LOWER BOUNDS TO ENERGY EIGENVALUES IN PERTURBATION THEORY,**
by Per-Olov Lowdin. 1 Jun 64, 59p Preprint no. 64
Grant NsG512
NASA CR-62299
Distribution: No limitation. Upsula Univ. (Sweden). Quantum Chemistry Group Technical note no. 120.

Descriptors: (*Perturbation theory, Energy).

**N65-23004** **Field 12A**
**CFSTI Prices: HC$1.00 MF$0.50**
Colorado State Univ., Fort Collins. Dept. of Mathematics and Statistics.
**A MODIFICATION OF THE KUHN-TUCKER THEOREM.**
Technical rept. no. 1, 1 Jun-31 Dec 64,
by Kenzo Seo. Dec 64, 3p
Grant NsG 569
NASA CR-62550
Distribution: No limitation.

Descriptors: (*Functions, Minimax technique), (*Minimax technique, Functions).

**N65-27381** **Field 12A**
**CFSTI Prices: HC$1.00 MF$0.50**
Maryland Univ., College Park. Computer Science Center.
**ON DISCRETIZATION AND DIFFERENTIATION OF OPERATORS WITH APPLICATION TO NEWTON'S METHOD.**
Technical rept.,
by James H. Ortega and Werner C. Rheinholdt. May 65, 25p Rept. no. TR-65-16
Grant NASA NsG198
NASA CR-63634
Distribution: No limitation.

Descriptors: (*Operators (Mathematics), Numerical methods ; procedures).

**N65-29964** **Field 12A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**ON THE EFFICIENT USE OF PREDICTOR-CORRECTOR METHODS IN THE NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS,**
by David Rodabaugh and James R. Wesston. Aug 65, 40p NASA-TN-D-2946
Distribution: No limitation.

Descriptors: (*Differential equations, Numerical methods ; procedures).

Identifiers: Predictor-corrector methods.

**N65-32182** **Field 12A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Washington, D. C. George C. Marshall Space Flight Center.
**HIGHER ORDER APPROXIMATIONS OF RUNGE-KUTTA TYPE,**
by E. Baylis Shanks. Sep 65, 23p NASA TN-D-2920
Distribution: No limitation.

Descriptors: (*Differential equations, Numerical methods ; procedures), (*Numerical analysis, Differential equations).

**PB-168 729** **Field 12A, 9B, 13G**
**CFSTI Prices: HC$2.00 MF$0.50**
Bureau of Public Roads, Washington, D. C.
**LEAST SQUARES POLYNOMIAL CURVE FITTING.**
Electronic computer program.
1965, 39p BPR Program M-1
Distribution: No limitation.

Descriptors: (*Curve fitting, Programming (Computers)), (*Programming (Computers), Curve fitting), (*Least squares method, Programming (Computers), Polynomials, Hydraulic models, Pipes.

The purpose of this program is to determine the polynomial of any desired degree which best fits a set of experimental data. The program is based on the least squares method of fitting a curve to experimental data that has one independent variable and one dependent variable. It has been used to fit curves to experimental data on Hydraulic Characteristics of Commonly Used Pipe Entrances. 'First Progress Report on Hydraulics of Short Pipes, Hydraulic Characteristics of Commonly Used Pipe Entrances,' by John L. French, 1955, U. S. Department of Commerce, National Bureau of Standards, pps. 48-74. The sample problem in this writeup uses one of these experimental hydraulic models. Given a set of experimental data containing m observations with a weighting factor, independent variable and dependent variable for each observation, the program produces the coefficients of the estimating equation desired, the residuals and standard error of estimate, and the coordinates of points necessary for plotting the curve. The program has been written to provide the results mentioned above for a specific degree of polynomial curve fit. This degree of polynomial curve fit is specified as input to the program.

## 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

**ACF-9** **Field 13M, 18D**
**CFSTI Prices: HC$1.00 MF$0.50**
ACF Industries, Inc., Albuquerque, N. Mex.
**FILAMENT WOUND SPHERE WITH POLAR OPENING. ROVER PROGRAM,**
by L. A. Ney. 4 Jan 65, 11p ACF-SA-706
Contract AT (29-1)-1352
Distribution: No limitation.

Descriptors: (*Spheres, Filament wound construction).

**AD-466 269** **Field 13B**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval Civil Engineering Lab., Port Hueneme, Calif.
**FACTORS INFLUENCING THE MODULUS OF DEFORMATION OF PAVEMENT BASES,**
by J. P. Nielsen. Jun 65, 25p Technical note no. TN-N-717
Proj. Y-F015-15-02-119
Distribution: No limitation.

Descriptors: (*Pavements, Deformation), Elasticity, Airports, Landing fields, Stresses, Materials, Theory, Sand, Rock (Geology), Asphalt, Sandwich construction.

This note is one of a series concerned with the NCEL research effort in the area of airfield pavements. Specifically, this note is concerned with the factors which influence the modulus of deformation (elasticity) of paving materials. It is shown that this parameter is influenced by the weight of the overlying bases in a pavement system. It is also demonstrated that this parameter increases with increasing depth of base and that bases incorporated in a multi-layered system develop higher moduli than those which are part of a two-layered system. (Author)

**AD-466 694** **Field 13L**
**CFSTI Price: HC$3.00**
Factory Mutual Research Corp., Norwood, Mass.
**PACKAGED, SELF-CONTAINED, FIRE SUPPRESSION SYSTEM FOR USE IN REMOTE AREAS WHERE A NORMAL WATER SUPPLY IS NOT AVAILABLE FOR STRUCTURAL FIRE FIGHTING.**
Final rept.,
by J. B. Smith, E. W. Cousins, J. S. Slicer, M. J. Miller, and R. L. Pote, Jr. 14 May 65, 73p Serial 15974
Contract NBy-32287
Distribution: No limitation.

Descriptors: (*Fire extinguishers, Automatic), (*Packaging, Fire extinguishers), (*Rural areas, Fire extinguishers), Sprinklers, Halogenated hydrocarbons, Bromine compounds, Fluorine compounds, Maintenance, Costs, Effectiveness, Reliability, Fire alarm systems, Fire safely, Navy, Design.

Five packaged, self-contained fire suppression systems were devised after a comprehensive review of pertinent material. Eighty-one references are attached. The two most promising concepts, as recommended by FMRC and approved by the Navy, are a multi-cycle, total flooding system using Bromotrifluoromethane and an automated sprinkler system using water. (Author)

**C13.10-270** **Field 13G, 20D, 8H**
**CFSTI Price: MF$1.25**
National Bureau of Standards, Washington, D. C.
**HYDRAULIC RESEARCH IN THE UNITED STATES 1965 (INCLUDING CONTRIBUTIONS FROM CANADIAN LABORATORIES),**
by Helen K. Middleton. 22 Jul 65, 242p NBS-Misc-Pub-270
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $1.25.

Descriptors: (*Hydraulic systems, Scientific research), United States, Hydrology, Bibliographies, Fluid dynamics.

**C13.46:227** **Field 13A**
**CFSTI Price: MF$0.50**
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
**THE JOULE-THOMSON PROCESS IN CRYOGENIC REFRIGERATION SYSTEMS.**
Technical note,
by J. W. Dean and D. B. Mann. 14 Feb 65, 44p NBS-TN-227
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402. $0.30.

Descriptors: (*Refrigeration systems, Joule-Thompson effect), (*Joule-Thompson effect, Cryogenics), Thermodynamics, Heat exchangers, Performance (Engineering), Helium, Nitrogen, Hydrogen.

Identifiers: Parahydrogen.

A comprehensive analysis of the Joule-Thompson process as applied to cryogenic refrigeration systems is presented. The descriptions of the process already in the literature are usually for specific applications. In contrast, performance characteristics are presented here for helium, para-hydrogen, and nitrogen operations over a large range of process parameters. (Author)

**CNLM-5245** **Field 13H, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Pratt and Whitney Aircraft, Middletown, Conn. Advanced Nuclear Engineering Lab.
**WELDING AND ANNEALING FACILITY FOR REFRACTORY METALS,**
by G. L. Gould. 1 Oct 63, 15p
Contract AT (30-1)-2789
Distribution: No limitation.

Descriptors: (*Welding, Refractory metals), (*Refractory metals, Annealing).

**EURAEC-1400** **Field 13H**
**CFSTI Prices: HC$3.00 MF$0.75**
Chantiers de l'atlantique Penhoet-Loire, Paris (France).
**STUDY OF THE APPLICATION OF THE VERTICAL WELDING PROCESS UNDER ELECTRO-CONDUCTING SLAG ON THICK STEEL PLATES IN SHOP OR FIELD CONDITIONS.**
Special rept no. 6.
20 Nov 62, 68p EUR-2359
Contract 054-61-12-RDF
Distribution: No limitation.

Descriptors: (*Welding, Steel), (*Steel, Welding).

**FS2.21:51** **Field 13B, 6J, 7D**
**CFSTI Price: MF$2.00**
Public Health Service, Washington, D. C. Div. of Air Pollution.
**SULFUR OXIDES AND OTHER SULFUR COMPOUNDS; A BIBLIOGRAPHY WITH ABSTRACTS,**
by Anna Grossmann Cooper. 1965, 393p Bibliography series-56, Pub-1093
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $2.25.

Descriptors: (*Sulfur compounds, Air pollution), (*Air pollution, Sulfur compounds), (*Public health, Air pollution), Oxides, Waste gases, Toxicity, Toxic tolerances, Industrial medicine, Bibliographies, Abstracts.

Abstracts by subject: Sources of oxides of sulfur, Emissions composition, Atmospheric reactions involving oxides of sulfur, Nature of atmospheres, Human epidemiology, Experimental human exposure to sulfur dioxide, Industrial exposures, Animal epidemiology, Experimental animal exposure to sulfur dioxide, Plant epidemiology and experimental exposure of plants, Materials damage, visibility reduction, Control devices or methods and instrumentation development, Selected publications.

**N65-13535** **Field 13H, 9A**
**CFSTI Price: MF$0.75**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**WELDING FOR ELECTRONIC ASSEMBLIES.**
Technology handbook,
by S. D. Ebneter. Nov 64, 86p NASA-SP-5011
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.40.
Distribution: No limitation.

Descriptors: (*Electronic equipment, Spot welding), (*Welding, Miniature electronic equipment).

**N65-17255** **Field 13H**
**CFSTI Prices: HC$2.00 MF$0.50**
Space Sciences Lab., California Univ., Berkeley.
**INVESTIGATION OF KILOVOLT ION SPUTTERING.**
Quarterly progress rept.,
by Harold P. Smith, Jr., and F. C. Hurlbut. 31 Jan 65, 30p Series 6, Issue 4
Contract NAS3 5743
NASA CR-54129
Distribution: No limitation.

Descriptors: (*Sputtering, Ion beams), (*Ion beams, Sputtering).

**N65-24996** **Field 13A**
**CFSTI Prices: HC$4.00 MF$1.00**
Research and Advanced Development Div., AVCO Corp., Wilmington, Mass.
**RADIANT HEATING SIMULATION.**
Final rept.,
by T. K. Pugmire and R. W. Liebermann. 3 May 65, 136p Rept. no. RAD-TR-65-6
Contract NAS9 3507
NASA CR-65023
Distribution: No limitation.

Descriptors: (*Heating, Simulation).

**N65-25245** **Field 13H**
**CFSTI Prices: HC$4.00 MF$0.75**
Space and Information Systems Div., North American Aviation, Inc., Downey, Calif.
**PRE-STRAIN WELD DEVELOPMENT PROGRAM.**
Final rept.
23 Apr 65, 119p Rept. no. SID-65-649
Contract NAS8 11690
NASA CR-63135
Distribution: No limitation.

Descriptors: (*Welds, Strain (Mechanics)).

**N65-28851** **Field 13G**
**CFSTI Prices: HC$1.00 MF$0.50**
Honeywell, Inc., Minneapolia, Minn.
**STUDY PROGRAM TO DETERMINE THE ACCELERATION ENVIRONMENT CAPABILITY OF THE GG159C GAS-BEARING SPINMOTOR.**
Final rept. suppl.,
by G. J. Erickson. 10 Aug 64, 6p Rept. 1727-FR-2
Contracts NAS7-100, JPL-950604
NASA CR-73844
Distribution: No limitation.

Descriptors: (*Engines + motors, Environmental tests).

**N65-31555** **Field 13K**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ELECTRODYNAMIC MERCURY PUMP,**
by A. Vary. Sep 65, 17p NASA-TN-D-2965
Distribution: No limitation.

Descriptors: (*Electromagnetic pumps, Mercury), (*Mercury, Electromagnetic pumps).

**N65-33924** **Field 13K**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**DESIGN AND OVERALL PERFORMANCE OF AN AXIALFLOW PUMP ROTOR WITH A BLADE-TIP DIFFUSION FACTOR OF 0.66,**
by Max J. Miller and James E. Crouse. Sep 65, 29p
NASA TN-D-3024
Distribution: No limitation.

Descriptors: (*Impellers, Design), (*Pumps, Impellers).

**N65-34226** **Field 13I**
**CFSTI Price: MF$0.50**
National Aeronautics and Space Administration, Washington, D. C. Technology Utilization Div.
**ELASTIC ORIFICES FOR GAS BEARINGS.**
Technology utilization rept.
Aug 65, 17p NASA-SP-5029
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.20.
Distribution: No limitation.

Descriptors: (*Gas bearings, Orifices), (*Orifices, Gas bearings).

**N65-34245** **Field 13H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**EXTRUSION AT TEMPERATURES APPROACHING 5000F,**
by Charles A. Gyorgak. Sep 65, 24p
NASA TND-3014
Distribution: No limitation.

Descriptors: (*Extrusion, High-temperature research), (*Refractory metal alloys, Extrusion).

**N65-34426** **Field 13H**
**CFSTI Price: MF$0.75**
National Aeronautics and Space Administration, Washington, D. C. Technology Utilization Div.
**SELECTED SHOP TECHNIQUES. 71 SELECTED SUGGESTIONS FOR MACHINISTS, MECHANICS, AND TECHNICIANS.**
Technology Handbook.
Aug 65, 108p NASA-SP-5010
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.
Distribution: No limitation.

Descriptors: (*Machine shop practice, Instruction manuals), (*Instruction manuals, Machine shop practice).

**N65-34501** **Field 13D, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**STRENGTH COMPARISON OF FLAWED SINGLELAYER AND MULTILAYER AISI 301 STAINLESS-STEEL PRESSURE VESSELS AT CRYOGENIC TEMPERATURES,**
by William S. Pierce. Oct 65, 21p
NASA TN-D-2949
Distribution: No limitation.

Descriptors: (*Pressure vessels, Stainless steel), (*Stainless steel, Cryogenics).

**N65-35068** **Field 13D, 22D**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**EVALUATION OF A SUBSCALE INTERNALLY INSULATED FIBER-GLASS PROPELLANT TANK FOR LIQUID HYDROGEN,**
by Laurence J. Heidelberg. Oct 65, 32p NASA-TND-3068
Distribution: No limitation.

Descriptors: (*Propellant tanks, Glass textiles), (*Liquefied gases, Hydrogen).

**Patent 3,216,648** **Field 13G**
**AUTOMATIC BLOWDOWN SYSTEM FOR COMPRESSORS.**
Patent assigned to Navy,

by Stephen H. Ford. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Compressors, Condensation), (*Condensation, Separation), Patents, Automatic, Moisture.

The method is for removing condensate from the successive stages of a multistage compressor. The method includes selectively connecting accumulator apparatus with the separator in each stage in an order of increasing pressure, thereby transferring condensate from the separators to the accumulator apparatus, and connecting the latter with a drain device.

**Patent 3,217,132** **Field 13H, 11F**
**WELDING TECHNIQUE FOR ALUMINUM ALLOYS.**
Patent assigned to Army,
by David E. Schillinger. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Aluminum alloys, Welding), (*Welding, Aluminum alloys), Patents.

Aluminum alloy sheets are welded by abutting the ends of the sheets, clamping them in a fixed relationship and establishing a dry inert gas atmosphere about the ends. A sub-zero temperature coolant is circulated near the ends. The weld, by consumable electrode arc welding, is formed while the coolant is circulated. The coolant flow is then stopped and a heating fluid is circulated near the ends and the inert atmosphere is continued until conditions of weld contamination have ceased to exist.

**Patent 3,218,535** **Field 13I, 13G**
**SERVO-CONTROLLED SHAFT POSITION DEVICE.**
Patent assigned to Navy,
by James E. Holthaus, Marvin E. Botchkiss, and John H. Stachlin. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Positioning devices (Machinery), Servomechanisms), (*Shafts, Positioning devices (Machinery)), Patents, Control systems, Circuits, Radar antennas, Airborne, Radioactivity, Materials, Handling.

The device is useful in the stepped rotation of quarter wave plates in airborne radar antennas, or in the handling of radioactive materials. An open loop logic circuit is provided for discreetly and selectively stepping a shaft or load rotatively about its axis to a preselected position.

**PB-168 691** **Field 13J**
**CFSTI Prices: HC$11.70 MF$4.00**
Maritime Administration, Washington, D. C. Office of Ship Construction.
**STANDARD SPECIFICATION FOR CARGO SHIP CONSTRUCTION.**
Revised ed.
1 Nov 65, 868p
Distribution: No limitation. Revision of rept. dated 1 Jun 65.

Descriptors: (*Cargo ships, Construction), (*Specifications, Cargo ships), Standards.

**PB-168 712** **Field 13C, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Bureau of Public Roads, Washington, D. C. Div. of Development.
**ANALYSES OF EQUIPMENT OPERATION COSTS AND RENTALS.**
Electronic computer program,
by Ruth B. Ross. 1965, 39p
BPR Program A-1
Distribution: No limitation.

Descriptors: (*Road-building equipment, Costs), (*Programming (Computers), Road-building equipment), Roads, Flow charting, Performance (Engineering).

This electronic computer program for the Analyses of Equipment Operation Costs and Rentals has been designed to provide the equipment manager and other State highway officials readily available and current information on the cost and performance of each unit of their equipment, in conformance with the Manual of Uniform Highway Accounting Procedures of the American Association of State Highway Officials. The program has been developed with maximum flexibility, so that it can be used in any State highway department, regardless of the way in which costs are reported or derived. Consequently, any State can immediately use the program without revising their cost reporting procedures. (Author)

**PB-168 713** **Field 13M, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Nebraska State Dept. of Roads.
**COMPUTATION OF CONTINUOUS BEAM CHARACTERISTICS (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by L. N. Ress, H. G. Schlitt, and G. C. Strobel. 1965, 32p
BPR Program ST-2
Distribution: No limitation.

Descriptors: (*Beams (Structural), Programming (Computers)), (*Programming (Computers), Beams (Structural)), Moment of inertia.

Identifiers: IBM 650.

The problem consists of determining carry-over factors, stiffness factors and fixed-end moments for a continuous beam which is a part of a structure or frame, given the span lengths and moments of inertia. The continuous beam must be solved a span at a time. Each span is statically indeterminate and is treated as an individual problem. The method used for solving the problem is the 'Moment Area Method.' The 'Moment Area Method' is based on two basic principles, in addition to the laws of statics, which are as follows: (1) When a member is subject to flexure, the change in slope of the elastic curve between any two points is equal in magnitude to the area of the M/EI diagram between these two points. (2) When a member is subject to flexure the ordinate from any point Q on the elastic curve to a tangent drawn to the elastic curve at any other point P is equal in magnitude to the moment of the area of the M/EI diagram between the two points about the point Q. (Author)

**PB-168 715** **Field 13B, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Bureau of Public Roads, Washington, D. C.
**ELECTRONIC COMPUTER PROGRAM FOR HYDRAULIC ANALYSIS OF CIRCULAR CULVERTS.**
Revised ed.,
by Richard C. Tennent and Lester A. Herr. Jul 65, 50p BPR Program-HY-1
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Bridges, Hydrology), (*Programming (Computers), Civil engineering), Roads, Drainage, Hydrodynamics, Design, Pipes, Structures.

Identifiers: Culverts.

The program is used for the hydraulic analysis of circular pipe culverts for given hydrological data and site conditions. The program produces number of pipes, pipe sizes, headwater and outlet velocities for inlet conditions and outlet conditions. Outlet control calculations make use of backwater computations, whenever necessary, to compute headwater. (Author)

**PB-168 716** **Field 13B**
**CFSTI Prices: HC$2.00 MF$0.50**
Bureau of Public Roads, Washington, D. C.
**ELECTRONIC COMPUTER PROGRAM FOR HYDRAULIC ANALYSIS OF PIPE-ARCH CULVERTS,**
by Richard C. Tennent, Lester A. Herr, and Webster H. Collins. Nov 65, 45p
BPR Program-HY-2
Distribution: No limitation.

Descriptors: (*Pipes, Hydrodynamics), (*Bridges, Hydrodynamics), Programming (Computers), Analysis, Pressure, Velocity, Structures, Civil engineering.

Identifiers: Culverts.

The program is used for the hydraulic analysis of pipe-arch culverts for given hydrological data and site conditions. The program selects, from a table of pipearch culverts, the culverts which satisfy the hydrological data and site conditions for inlet control and outlet control. The output includes: number of pipes, span, rise, headwater, and outlet velocities. Outlet control calculations make use of backwater calculations, whenever necessary, to compute headwater. (Author)

**PB-168 717** **Field 13B, 9B**
**CFSTI Prices: HC$3.00 MF$0.50**
Bureau of Public Roads, Washington, D. C.
**ELECTRONIC COMPUTER PROGRAM FOR HYDRAULIC ANALYSIS OF BOX CULVERTS,**
by James R. Link, Richard C. Tennent, and J. Harrison. Oct 65, 51p BPR Program-HY-3
Distribution: No limitation.

Descriptors: (*Bridges, Hydrodynamics), (*Structures, Drainage), (*Programming (Computers), Civil engineering), Hydrology, Pipes, Rectangular bodies, Roads.

Identifiers: Culverts.

The program is used for the hydraulic analysis of box culverts for given hydrological data and site conditions. The program determines the size of culvert which satisfies the hydrological data and site conditions for inlet control and outlet control. The output includes: number of barrels, culvert width, culvert height, headwater and outlet velocities. Outlet control calculations make use of backwater calculations, whenever necessary, to compute headwater. (Author)

**PB-168 718** **Field 13B, 9B, 8H**
**CFSTI Prices: HC$3.00 MF$0.50**
Bureau of Public Roads, Washington, D. C.
**ELECTRONIC COMPUTER PROGRAM FOR HYDRAULICS OF BRIDGE WATERWAYS,**
by Kenneth H. Welty and Lawrence J. Harrison. Mar 64, 51p BPR Program-HY-4
Distribution: No limitation.

Descriptors: (*Bridges, Hydrology), (*Programming (Computers), Civil engineering), (*Inland waterways, Bridges), Roads, Drainage, Hydrodynamics.

The program is used for the hydraulic analysis of waterways at bridge sites and for determining information on backwater that can be produced or caused by a bridge. The program consists of two parts. Part 1 analyzes the open channel or natural stream section and produces typical stage-discharge information. Part 2 analyzes the constricted opening and determines water velocities and backwater heights for given discharges. The program was developed for the IBM 1410 computer in FORTRAN, a problem oriented programming language. The FORTRAN statements are furnished in place of the usual block diagram. (Author)

**PB-168 719** **Field 13B, 9B**
**CFSTI Prices: HC$4.00 MF$1.00**
California State Div. of Highways.
**TRAVERSE COMPUTATION (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by S. F. Persselin and J. Vliet. 1965, 150p
BPR Program SU-2
Distribution: No limitation.

Descriptors: (*Roads, Surveying), (*Programming (Computers), Surveying), (*Surveying, Programming (Computers)), California.

The program is designed to perform the trigonometric computations encountered in surveys, or in any problem involving the relations between the sides and angles of triangles. It will deduce from given parts other required parts, calculate area and produce an orderly tabulation of courses with their computed or known factors. Provision is made for some interdependence of traverses, allowing data from specified courses to be stored for later use. Included in this program is a routine for the solution of horizontal curve data. In the California program, from which this library version was developed, provision is made for the use of descriptive information in both input and output so that the output tabulation of traverse courses can include comments to aid the engineer in his consideration of the results of the computation. While this is a desirable feature, it has not been included in the library program simply in order that the program may be directly usable by those who do not have installations which provide for handling alphabetic information as well as by those who do. (Author)

**PB-168 720** **Field 13M, 9B**
**CFSTI Prices: HC$4.00 MF$0.75**
Rummel, Klepper and Kahn, Baltimore, Md.
**BRIDGE PIER ANALYSIS (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by Albert R. Stallknecht. Dec 59, 113p
BPR Program ST-8
Distribution: No limitation.

Descriptors: (*Piers, Loading (Mechanics)), (*Programming (Computers), Piers), Moments, Shear stresses, Reinforced concrete, Bridges, Roads, Stresses.

Identifiers: IBM 650.

The program was developed for the analysis of various loading conditions on reinforced concrete piers for typical highway bridges. Pier configuration is limited to twoor three-column single-story bents. The program is used to develop final moments, shears and reactions for each member at each joint in the pier bent. Up to 16 incident concentrated loads can be applied to the pier cap, 5 loads per bay and 3 loads on each cantilever section at the end joints of the pier cap. Provisions are made in the analysis for horizontal and vertical sway, for shrinkage and temperature force application. The Hardy Cross Method of Moment Distribution is used. All members must be prismatic excepting the cantilever sections of the pier cap. Circular columns are excluded. (Author)

**PB-168 721** **Field 13B, 9B**
**CFSTI Prices: HC$3.00 MF$0.50**
Illinois State Div. of Highways.
**HIGHWAY EARTHWORK COMPUTATIONS (DEVELOPED FOR BENDIX G-15A COMPUTER).**
Electronic computer program,
by Theodore F. Morf. 1965, 58p
BPR Program E-1
Distribution: No limitation.

Descriptors: (*Roads, Soils), (*Programming (Computers), Roads), Design, Terrain, Illinois, Construction, Volume.

Identifiers: Bendix G-15A computer.

Three features of the Illinois program that are distinctive are (1) the method used for modifying roadbed coordinates, (2) the method used for locating slopestake points, and (3) the method used for determining a variable shrinkage factor. The coordinates of each point on the template are derived from the preceding point as points are taken in order from the centerline outward. A modification in pavement width or in another individual dimension will not change the basic formulae used to determine template coordinates. To facilitate mowing and to improve the appearance of the roadside it may be desirable to extend a slope beyond its intersection with the terrain nearest the ditch point where there is more than one intersection. The Illinois program accomplishes this by starting the slope-stake search with the point furthest to the left (or right) and working toward the centerline in finding points of intersection and in computing cut and fill areas. The shrinkage factor subroutine is based on a study of actual behavior of materials on highway projects in Illinois over a period of years. The formula developed allows for higher wastage and shrinkage in sections of relatively small size. (Author)

**PB-168 722** **Field 13B, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
Missouri State Dept. of Highways.
**HIGHWAY EARTHWORK COMPUTATIONS (PREPARED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by W. D. Vanderslice. 1965, 95p
BPR Program E-2
Distribution: No limitation.

Descriptors: (*Roads, Soils), (*Programming (Computers), Roads), Design, Terrain, Construction, Missouri, Rock (Geology), Volume.

Identifiers: IBM 650.

The Missouri program was prepared to fit Missouri construction standards and to cause the computer itself to supply a maximum number of design decisions. The one program will handle both single lane and dual lane designs. In addition it will compute rock excavation quantities separately from earth excavation quantities. Full advantage was taken of the standard Missouri practice of designing dual lane pavements to a single profile grade. This feature in conjunction with the system developed to use the same form of input for template points on both single lane and dual lane designs, enables the computer program to determine the design slopes and quantities for either type of highway. Core drill records are used by the computer to subdivide cross-sections containing rock excavation. The computer selects rock slopes and determines rock excavation where rock is present between template and ground elevations. Job details are designed for input in such a way as to force the computer to automatically select the proper corrections for superelevation, widening, rock, or other special material excavation, median width, slopes, and other variables. (Author)

**PB-168 723** **Field 13M, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Richardson, Gordon and Associates, Pittsburgh, Pa.
**ANALYSIS OF RECTANGULAR REINFORCED CONCRETE COLUMNS (DEVELOPED FOR BENDIX G-15).**
Electronic computer program,
by Jerry C. L. Chang. 1960, 30p
BPR Program ST-4
Distribution: No limitation.

Descriptors: (*Beams (Structural), Stresses), (*Reinforced concrete, Stresses), (*Programming (Computers), Beams (Structural)), Mathematical analysis, Steel, Moment of inertia, Supports.

Identifiers: Bendix G-15 computer.

The problem consists of determining the maximum concrete and steel stresses in a square or rectangular reinforced concrete column subjected to an eccentric axial load. The solution is accomplished by a series of trials. Initially the neutral axis is assumed to be coincident with the axis of symmetry of the section. The properties of the transformed section are computed on this basis and the four corner concrete stresses are determined. From these, the position of the neutral axis is computed, properties of the corresponding effective section are found, and new corner concrete stresses are determined. This cycle is repeated as many times (usually three or four) as necessary to obtain a final solution. At the end of each cycle or trial, the new corner stresses are compared with those previously computed and when agreement within acceptable tolerance is obtained, the solution is complete. Done manually, this problem may take as long as one may-day per trial. Using the electronic computer, the entire problem can be solved in about five minutes including the time required for input. (Author)

**PB-168 730** **Field 13B, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge. Photogrammetry Lab.
**DIGITAL TERRAIN MODEL SYSTEM: VERTICAL ALIGNMENT PROGRAMS (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by C. L. Miller and R. A. Laflamme. 1965, 34p
BPR Program VA-1
Distribution: No limitation.

Descriptors: (*Roads, Design), (*Programming (Computers), Roads), (*Terrain models, Digital systems), Alignment, Terrain, Geometry, Flow charting.

Identifiers: IBM 650.

The programs designated VA-1 and VA-2 in the instructional manuals developed at the Massachusetts Institute of Technology are both included in this program (BPR VA-1, (Bureau of Public Roads VA-1)). PART 1, the Basic Vertical Alignment Program, computes the highway profile geometry. Input consists of the station and elevation of each VPI and the alignment origin and terminus, the vertical curve length at each VPI, and cross section data produced as output of program BPR HA-2, PART 1 (MIT HA-1, PB-168 735). The output includes the station and elevation of each VPC and VPT, the rate of grade for each tangent, the profile grade elevation at each station where a cross section was taken and the cross section data used as input. PART 2, the Highway Profile Geometry Program, computes profile grade elevations at full stations or plusses at constant intervals. The input consists of the station and elevation of each VPI and the alignment origin and terminus, the vertical curve length at each VPI, the first constant interval station, and the constant increment between stations. The output consists of the profile grade elevations at the designated stations or plusses. (Author)

**PB-168 731** **Field 13M, 8M, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
New York State Dept. of Public Works.
**STABILITY ANALYSIS OF SLOPES AND EMBANKMENT FOUNDATIONS.**
Electronic computer program,
by Charles E. Carlson and William P. Hofmann.
Feb 65, 64p
BPR Program S-3
Distribution: No limitation.

Descriptors: (*Soil mechanics, Stability), (*Roads, Foundations (Structures)), (*Programming (Computers), Soil mechanics), Analysis.

Identifiers: FORTRAN, IBM 1620.

The computer program can be used to analyze the stability of cut slopes, fill slopes and embankment foundations. Cross sections containing any irregular configuration of ground surface and subsoil layers that can be approximated by thirty lines can be analyzed. A failure arc and a factor of safety sufficiently close for practical purposes to the most critical failure arc and the lowest factor of safety are found automatically. As with any stability analysis, the understanding of the underlying assumptions and the choice of the appropriate shear strength parameters are essential to the obtaining of a realistic answer to the proper evaluation of the results. Several sample problems which show the capabilities and applications of the program are included. The original program was developed in FORTRAN programming language for the IBM 1620-20K data processing system. The FORTRAN statements are furnished in place of the usual block diagram. (Author)

**PB-168 733** **Field 13B, 9B**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Public Roads, Washington, D. C. Div. of Development.

**COMPUTATION OF BORROW PIT QUANTITIES.**
Electronic computer program,
by H. M. Hancock. 1965, 12p
BPR Program E-3
Distribution: No limitation.

Descriptors: (*Roads, Soils), (*Programming (Computers), Roads), Design, Construction.

By means of this program, the volume of material removed from a borrow pit is determined directly from preliminary and final cross-section notes with a minimum of processing. First the volume of earth between the original ground surface and an arbitrary horizontal datum plane is determined, then the volume between the final ground surface and the same horizontal datum plane is determined. The difference between these two volumes is the volume of the material removed. The program can be used for determining either progress payments or final payment for 'borrow' and it can also be used to estimate the quantity of material available from a proposed borrow pit based on borings or other methods of subsurface exploration. (Author)

**PB-168 734** **Field 13B, 9B**
**CFSTI Prices: HC$3.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge. Photogrammetry Lab.
**DIGITAL TERRAIN MODEL SYSTEM: RECONNAISSANCE EARTHWORK (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by C. L. Miller, R. A. Laflamme and L. E. Nihen. 1965, 51p
BPR Program E-4
Distribution: No limitation.

Descriptors: (*Roads, Soils), (*Terrain models, Digital systems), (*Programming (Computers), Roads), Alignment, Terrain, Design, Volume.

Identifiers: IBM 650.

The program is used for rapid computation of approximate earthwork quantities for evaluating alternative horizontal alignments during the reconnaissance stage of location. Input consists of (1) terrain data taken along the centerline and along two offset lines parallel to the centerline and either side of it, giving three terrain points for each cross section, (2) vertical alignment data to define the grade line and (3) template specification data. Output consists of (1) vertical curve data, (2) grade elevations, (3) slope stake coordinates and (4) earthwork volumes. (Author)

**PB-168 735** **Field 13B, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
Massachusetts Inst. of Tech., Cambridge. Photogrammetry Lab.
**DIGITAL TERRAIN MODEL SYSTEM: HORIZONTAL ALIGNMENT PROGRAMS (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by C. L. Miller and R. A. Laflamme. 1965, 60p
BPR Program HA-2
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Roads, Design), (*Programming (Computers), Roads), (*Terrain models, Digital systems), Alignment, Terrain, Geometry, Flow charting.

Identifiers: IBM 650.

The programs designated HA-1, HA-2, HA-3 and HA-4 in the instructional manuals developed at the Massachusetts Institute of Technology are included in this program (Bureau of Public Roads HA-2). PART 1 (MIT HA-1), the Basic Horizontal Alignment Program, computes the centerline geometry of the alignment and mathematically relates the alignment to the DTM (digital terrain model) terrain data. Input consists of the State plane coordinates of the baseline origin, the alignment origin and terminus and each PI; the radius of the curve to be used at each PI; the station of the alignment origin; the azimuth of the baseline; and the DTM terrain data. The output includes the station of each PI, PC and PT; the external angle between tangents and the tangent length for each curve; the azimuth of each tangent; and the centerline station, baseline offset, interpolated ground elevation at centerline, and skew angle at each terrain cross section. PART 2 (MIT HA-2), the Even Station Interpolation Program, computes the ground elevations at stations at equal intervals (either full stations or plusses) for plotting a ground profile. PART 3 (MIT HA-3), the Parallel Offset Alignment Program, computes the geometry of two parallel offset lines as well as the centerline.

**PB-168 736** **Field 13B, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge. Photogrammetry Lab.
**DIGITAL TERRAIN MODEL SYSTEM: PRELIMINARY EARTHWORK (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by C. L. Miller and R. A. Laflamme. 1965, 45p
BPR Program E-5
Distribution: No limitation.

Descriptors: (*Roads, Soils), (*Terrain models, Digital systems), (*Programming (Computers), Roads), Alignment, Terrain, Design, Volume.

Identifiers: IBM 650.

This program is used for studies of alternate alignments and grades to provide preliminary estimates of earthwork quantities and right-of-way requirements. The very simple template section that was used by the reconnaissance program (BPR-E4, PB-168 734) is retained by this program to gain efficiency in computer operation. In contrast to the reconnaissance program this program considers all known terrain points in detail and avoids the approximations inherent in the use of terrain sections defined by only three points. Input consists of (1) the output from program BPR VA-1 (Part 1, PB-168 730), (2) the terrain data and (3) the template specification data. Output consists of (1) slope stake coordinates, (2) earthwork volumes, and (3) such input values as may be desired. (Author)

**PB-168 738** **Field 13M, 9B**
**CFSTI Prices: HC$1.00 MF$0.50**
Texas State Highway Dept.
**SKEWED BRIDGE GEOMETRY STRAIGHT ALIGNMENT.**
Electronic computer program,
by D. C. Greer. May 65, 22p
BPR Program ST-3
Distribution: No limitation.

Descriptors: (*Bridges, Geometry), (*Programming (Computers), Bridges), Alignment, Beams (Structural), Design, Construction.

This program was developed for finding the station of any desired point on any working line; the skew distance along the line to the point; the elevation at the point for finished grade, also for top of cap elevation for the point, if it is a point over a beam support; and the length and slope of the beam between a corresponding point on a previous working line and the point, if it is a point where top of cap elevation is computed. The program provides most of the dimensions needed for the design and construction of bridges with skewed bents, constant roadway widths and straight roadway alignment. (Author)

**PB-168 739** **Field 13M, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
Baker (Michael, Jr.), Inc., Rochester, Pa.
**COMPOSITE BEAM ANALYSIS AND DESIGN (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by Webster H. Collins. 1960, 87p
BPR Program ST-5
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Beams (Structural), Bridges), (*Programming (Computers), Beams (Structural)), Roads, Concrete, Steel, Design, Analysis, Tables, Moment of inertia, Composite materials.

Identifiers: IBM 650.

The program was developed primarily to compile design tables for simply supported composite concrete slab and rolled steel beam sections in accordance with the 1957 AASHO Standard Specifications for Highway Bridges. It is also applicable to the analysis or design of any simply supported composite concrete slab and steel stringer bridge deck. (Author)

**PB-168 740** **Field 13B, 5A, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
Bureau of Public Roads, Washington, D. C. Electronic Development Div.
**CRITICAL PATH METHOD REPORTS.**
Electronic computer program,
by Richard C. Tennent. May 64, 71p
BPR Program A-4
Distribution: No limitation.

Descriptors: (*Roads, Construction), (*Scheduling, Roads), (*Programming (Computers), Roads), Management planning, Management control systems, Costs, Time, Flow charting, Punched cards, Mathematical programming.

Identifiers: Critical path method, FORTRAN.

The computer system for the Critical Path Method Reports consists of three programs. The programs are CPM Calculation, CPM Calendar Dating and CPM Time-Sequence Plot. The CPM Calculations Program is used for doing the arithmetic calculations associated with the scheduling of a project. The results from this program become the information necessary for use by the other programs. The CPM Calendar Dating Program is used for either scheduling or monitoring purposes. The output is a calendar dated report of the starts and finishes. The CPM Time-Sequence Plot Program is used for the monitoring of the project. The report produced by the program is in the form of a bar chart showing the duration and total float of each activity on a calendar day scale. (Author)

**PB-168 741** **Field 13B, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Colorado State Dept. of Highways.
**BID TABULATION (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by William M. Barnes. 1965, 27p
BPR Program A-3
Distribution: No limitation.

Descriptors: (*Roads, Costs), (*Programming (Computers), Roads), Colorado.

Identifiers: IBM 650.

This program was developed in the Colorado Department of Highways to verify bidders' extensions and totals and to prepare a tabulation of bids in proper form as rapidly as possible. The output tabulation includes the bid items, units, quantities, engineer's unit prices, amounts and total, average unit prices and amounts for the five low bids, individual unit prices, amounts and totals for each of the five low bids and the verified totals for the other bids. If there are less than five bidders, the printing at the top of the 'Average' column is automatically modified to show the number of bids averaged. (Author)

**P-168 742** **Field 13B, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Wisconsin State Highway Commission.
**SUFFICIENCY RATING (DEVELOPED FOR IBM650 M.D.D.P.M.).**

Electronic computer program.
1965, 38p
BPR Program A-2
Distribution: No limitation.

Descriptors: (*Roads, Performance (Engineering), (*Programming (Computers), Roads), Wisconsin, Traffic, Effectiveness.

Identifiers: IBM 650, Evaluation.

This program is used in Wisconsin to rate the adequacy of highways on a uniform basis and to provide a means for comparing sections of highway. The rating represents a composite evaluation of the three principal qualities of a road--structural adequacy, service and safety. A short routine, designated PROGRAM I, is used to determine the average traffic volume on the highway system. This value is used in PROGRAM II, the sufficiency rating routine, to adjust the basic rating for a section of highway in accordance with the relative volume of traffic it carries. (Author)

**PB-168 743** **Field 13M, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
Washington State Dept. of Highways.
**MOMENT DISTRIBUTION AND INFLUENCE LINE CALCULATION (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by Paul Yeager, Eugene D. Lee and L. C. McReynolds. 1965, 58p
BPR Program ST-6
Distribution: No limitation.

Descriptors: (*Beams (Structural), Moments), (*Programming (Computers), Beams (Structural)), Supports, Loading (Mechanics).

Identifiers: IBM 650.

The program was developed for computing final end moments in beams and column tops of single story continuous frames. The beams may be integral with the columns. The program is also used for developing influence lines for moment at all of the tenth span points or at the 0.3, 0.5 and 0.7 span points, and for shear at the ends of each span. Provision is also made for computing ordinates of the final moment diagram for uniform loading. Distribution factors, carry-over factors and fixed-end moments must be included in given data. The Hardy Cross Method of Moment Distribution is used. (Author)

**PB-168 744** **Field 13B, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
Nebraska State Dept. of Roads.
**RIGHT-OF-WAY TRAVERSE AND AREA COMPUTATION (DEVELOPED FOR IBM-650 M.D.D.P.M.).**
Electronic computer program,
by L. N. Ress and H. C. Schlitt. 1965, 85p
BPR Program SU-1
Distribution: No limitation.

Descriptors: (*Roads, Surveying), (*Programming (Computers), Surveying), (*Surveying, Programming (Computers)), Nebraska.

The Right of Way Traverse computation in Nebraska is divided into two parts. Firstly, adequate information about a tract of land is needed to describe it in a deed, and secondly, the area of the tract is needed. Since the Double Meridian Distance method of calculating area requires as given information the lengths and bearings of each side or course of the tract, and since these bearings and lengths can be used to write a description, this method is used to calculate area. The program gives as output the lengths and bearings, using field information and a minimum of manual calculations as input. A separate program solves for area using the D.M.D. method. The program includes five basic solutions. These solutions fit a great majority of the problems encountered and some of the more complex problems can be handled as the person who is coding the input information gains experience. The first run gives as output the description needed for a deed. These output data are then used as input for the second run for which the output is the area. A listing of both outputs is made and sent to the R.O.W. Department.

**PB-168 746** **Field 13M, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
Bucknell Univ., Lewisburg, Pa. Dept. of Civil Engineering.
**ANALYSIS OF FIXED ARCHES, FRAMES AND RINGS (DEVELOPED FOR BURROUGHS E-101-3).**
Electronic computer program,
by John S. Hale, Jr. 1965, 92p
BPR Program ST-7
Distribution: No limitation.

Descriptors: (*Structures, Stresses), (*Programming ((Computers), Stresses), Moments, Thrust, Shear stresses, Rings, Mathematical analysis, Loading (Mechanics), Analysis.

Identifiers: Burroughs E-101-3 computer.

The program consists of three parts: (1) Computation of redundant reactions at the elastic center for unit vertical and horizontal loads at the center of each arch segment. (2) Computation of moment, thrust and shear at the center of each arch segment due to the reactions computed in Part 1 and the external loading. (3) Computation of influence line ordinates for moment, thrust and shear at the base, the crown and the center of each arch segment specified. Its use is limited to symmetrical structures. (Author)

**PB-168 839** **Field 13B**
**CFSTI Prices: HC$3.00 MF$0.75**
Badger (W. L.) Associates, Inc., Ann Arbor, Mich.
**ADVANCED WASTE TREATMENT BY DISTILLATION,**
by Joseph H. Neale. Mar 64, 63p
Contract Ph-86-63-33
AWTR 7;
PHS Pub-999-WP-9
Distribution: No limitation.

Descriptors: (*Wastes (Sanitary engineering), Distillation), (*Distillation, Wastes (Sanitary Engineering)), (*Water supplies, Purification), Corrosion, Deposition, Boiling, Fouling, Waste (Industrial), Sewage.

A desk top study was made of the scaling and corrosion effects to be expected in municipal wastewater distillation. A municipal water re-use cycle was assumed in which sufficient waste-water distillate would be mixed with waste water treated for organic contaminant removal only, to give a mixture suitable for the municipal water supply. The study shows that the concentration of scaling materials is small enough that, in many cases, distillation at a temperature of 400F should be possible. An economic advantage over sea-water distillation would be expected as a result. Potential corrosion problems exist, but only experimental work will determine the seriousness of these problems. Continuous boiling experiments were carried out on Ann Arbor sewage to determine the fouling effects of organic contaminants. Distillation of secondary effluent at temperatures up to 250F should not result in fouling. Data were not obtained above that temperature. Operation with primary effluent does not appear feasible without additional treatment for removal of suspended materials. (Author)

## 14. METHODS AND EQUIPMENT

**AD-285 168** **Field 14B**
**CFSTI Price: HC$2.00**
Naval Air Material Center, Philadelphia, Pa. Aeronautical Structures Lab.
**DESCRIPTION AND CAPABILITY OF ENVIRONMENTAL TEST FACILITIES AT THE AERONAUTICAL STRUCTURES LABORATORY,**
by R. J. Molella. 12 Sep 62, 41p NAMC-ASL-1042
Distribution: No limitation.

Descriptors: (*Test facilities, Environmental tests), Aeronautical laboratories, High-temperature research, Simulation, Test equipment, Vibration, Noise, Loading (Mechanics).

A description is given of environmental test facilities that can simulate the structural effects of temperature, structural loading, vibration, and acoustic noise. The facilities can simulate these environments simultaneously except for acoustic noise, the facility for which is a separate field site. The test facilities consist of heating equipment, rapid-loading equipment, shockloading equipment, vibration equipment, and acousticnoise equipment. Associated equipment such as instrumentation and data-handling equipment is also included in the overall facility. The power available for heating tests is 4,000 kv-a continuous and 8,000 kv-a for 3 minutes. This power is capable of heating areas from 25 to 1,000 square feet for respective heating rates of 200 to 5 Btu/sq ft. sec. Automatic control of this power for heating tests is accomplished by 64 channels of control equipment. Other equipment that can be automatically controlled includes a resonance-follower vibration system and a portable temperature chamber, which is capable of steady-state temperatures up to 1,200F and which can be used with either the 5-million-pound or 0.6-million-pound testing machine. The acoustic-noise facility is a field site with a single jet engine and associated acoustic accessories. (Author)

**AD-457 110** **Field 14B, 20D**
**CFSTI Price: HC$3.00**
Battelle Memorial Inst., Columbus, Ohio.
**WATER TUNNEL DESIGN AND RELATED INSTRUMENTATION CONSIDERATIONS AND A SELECTED BIBLIOGRAPHY ON INCOMPRESSIBLE INTERNAL FLUID FLOW,**
by J. L. Harp, V. O. Hoehne, J. M. Allen andG. R. Whitacre. 20 Nov 64, 60p
Contract DA-01-021-AMC-203 (Z)
RSIC 328
Distribution: No limitation.

Descriptors: (*Water tunnels, Design), (*Incompressible flow, Bibliographies), Fluid flow, Instrumentation, State-of-the-art reviews, Liquefied gases, Cryogenics, Design, Fuels, Pressure, Flow visualization, Cavitation, Two-phase flow.

The report presents the results of a state-of-the-art survey on flow-tunnel design and related instrumentation for tunnels using water or liquid nitrogen as the working fluid. The scope of the survey if purposely narrowed by considerations of the proposed tunnel to be designed and built at NASA's George C. Marshall Space Flight Center (MSFC). Initial application of the proposed tunnel will include internal-fluid-flow studies of cryogenic fluelsystem components or combinations thereof. Major considerations applicable to the principal components of the proposed tunnel are presented. Some specific recommendations are also presented for consideration by those who will undertake the actual design and operation of the proposed tunnel. Also included is a selected bibliography on internal fluid flow, with a brief description of each. The categories included are pressure drop; flow patterns including curved flows, mixing, and flow measurement; visualization including flow modeling, cavitation, and transients; flow of cryogenic fluids, and tow-phase flow. (Author)

**AD-465 897** **Field 14A, 5A**
**CFSTI Prices: HC$3.00 MF$0.75**
Aerospace Corp., El Segundo, Calif. Technical Operations.
**AN APPLICATION OF PERT/COST IN R AND D MANAGEMENT,**
by Albert T. Finney and Hyman Silver. 30 May 65, 67p TDR-469 (5111-01)-2
Contract AF04 (695)-469
SSD TR-65-77
Distribution: No limitation.

Descriptors: (*Research program administration, Cost effectiveness), (*Management planning, Costs), (*Management control systems, Costs), Operation, Time, Astronautics, Management engineering.

Identifiers: PERT COST system, Research and development.

This report describes the planning and implementing of an R and D space program which used an integrated PERT/ Cost system during all phases of program development. The operation of the system, the use to which the data was put, and the integration of the system with the work statement and cost proposal are discussed at some length. The PERT/Cost system successfully provided the types of information desired, aided in the development of a sophisticated program plan, and encouraged maximum utilization of the detailed cost information generated. A detailed preliminary evaluation of the system as it functioned in the subject program is provided with both its strong and weak points discussed.

**AD-466 119** **Field 14D, 9C**
**CFSTI Prices: HC$3.00 MF$0.75**
Naval Air Development Center, Johnsville, Pa. Aeronautical Electronic and Electrical Lab.
**AN/APG-59 RADAR RELIABILITY ASSESSMENT PROGRAM GUIDELINES,**
by Joseph Mignogna. 30 Jun 65, 60p Rept. no. NADC-EL-6513
Task RM3725007/2021/A106-00-05
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Radar equipment, Reliability (Electronics)), (*Reliability (Electronics), Test methods), Electronic equipment, Maintenance, Specifications, Checkout procedures, Failure (Electronics), Instruction manuals.

Identifiers: AN/APG-59.

This report provides the guidelines for the AN/APG-59 radar reliability program and for the assessment of all the deficiencies, discrepancies, and failures. The report details the reliability assessment techniques, procedures, data collection and dissemination, and all the pertinent documents, letters and forms required to assure adequate consideration of all parameters affecting the operational reliability of the AN/APG-59 radar and special support equipment.

**AD-467 828** **Field 14B, 1A**
**CFSTI Prices: HC$2.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
**PRESSURE PROBE AND SYSTEM FOR MEASURING LARGE BLAST WAVES.**
Technical rept.,
by J. Ray Ruetenik and S. Dean Lewis. Jun 65, 46p Rept. no. 105-2
Contract AF33 (616)-8499,
Proj. AF-5710
AFFDL TDR-65-35
Distribution: No limitation.

Descriptors: (*Shock waves, Pressure gages), (*Pressure gages, Shock waves), Measurement, Tests, Shock tubes.

A new pancake-type pressure probe was developed for the measurement of blast pressure waves during the BIG SEA sled tests. This probe employs transducers of the type selected for wing pressure measurements in that program. It was evaluated in the shock tube under a range of flow Mach numbers encountered during the test. From these shock tube tests, a probe form calibration was determined. Application of this type of probe to the BIG SEA tests is also described, including the mounting system, transducer and electronic calibration, and one blast wave record derived from this type of probe is presented. The results of the shockoverpressure measurements are compared with other test data. The pancake probe has a diameter of 4 inches and a thickness of 0.5 inch. The accuracy of measurement has been determined to be 3-5% of the shock overpressure for blast waves where the positive duration is 10 milliseconds or greater. The response time has been found to be less than 0.7 milliseconds. (Author)

**BNWL-SA-62** **Field 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**A SLIDING-SHAFT VACUUM LOCK FOR A MASS SPECTROMETER,**
by J. J. Stoffels and C. R. Lagergren. 19 May 65, 13p CONF-650519-1
Contract AT (45-1)-1830
Presented at annual conference of American Society of Testing Material Committee E-14 (13th), St. Louis, Mo. Distribution: No limitation.

Descriptors: (*Spectrum analyzers, Vacuum seals), (*Vacuum seals, Spectrum analyzers).

**C13.10:260-5** **Field 14B, 7D, 7B**
**CFSTI Price: MF$0.50**
National Bureau of Standards, Washington, D. C. Inst. for Materials Research.
**STANDARD REFERENCE MATERIALS: ACCURACY OF SOLUTION X-RAY SPECTROMETRIC ANALYSIS OF COPPER-BASE ALLOYS,**
by Robert Alvarez and Richard Flitsch. 15 Mar 65, 26p NBS-Misc-Publ-260-5
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402. $0.25.

Descriptors: (*Standards, Materials), (*X-ray spectroscopy, Copper alloys), (*Copper alloys, X-ray spectroscopy), Chemical analysis, Zinc, Aluminum, Solutions, Fluoresence.

X-ray fluorescence spectrometry was investigated as an independent method for the analysis of certain major constituents in NBS standard reference materials. The determination of copper and zinc in cartridge and aluminum brass samples which were to be certified as standard materials, was selected for study. After a preliminary analysis, a solution of the unknown and a closely-matched synthetic standard were compared without the use of an internal standard or added control element. To achieve reliable results, close control of the type and concentration of acid was found necessary, and, for cells employing films as windows, the position of the film was critical. The temperature rise of the cell during irradiation was 0.1C, which did not contribute significantly to error. Typical coefficients of variation obtained for individual results in a group of 8 runs were 0.3% for copper and 0.4% for zinc. The agreement between chemical and x-ray results was within 0.3% of the amount present for both elements. (Author)

**C13.10:263** **Field 14B**
**CFSTI Prices: HC$1.00 MF$1.25**
National Bureau of Standards, Washington, D. C.
**REPORT OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES (49th), 1964.**
by L. J. Chisholm. 1 Feb 65, 237p NBS-Misc-publ-263
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $1.00.

Descriptors: (*Standards, Symposia), (*Weight, Standards), (*Measurement, Standards), Reports.

**C13.10-260** **Field 14B**
**CFSTI Price: MF$0.50**
National Bureau of Standards, Washington, D. C. Office of Standard Reference Materials.
**STANDARD REFERENCE MATERIALS: CATALOG AND PRICE LIST OF STANDARD MATERIALS ISSUED BY THE NATIONAL BUREAU OF STANDARDS.**
1 Oct 65, 50p NBS-Misc-Publ-260, NBS-Misc-Publ-241 superseded
Pub. in Federal Register v30 n74 pt2 Apr 17 1965. Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.45.

Descriptors: (*Standards, Catalogs), (*Materials, Standards), Costs, Chemical analysis, Alloys, Calibration, Measurement.

A descriptive listing is given of the many different Standard Reference Materials issued by the National Bureau of Standards to calibrate a measurement system, or to produce scientific data that can be referred to a common base. A schedule of prices and amounts, as well as directions for ordering, is included. For composition standards summary tables of analyses are presented, to indicate the type of standards presently available. Announcements of new standard reference materials will be made in the Federal Register, in scientific and trade journals, and in the Technical News Bulletin of the National Bureau of Standards. The current status of the various standards will be indicated by an insert sheet available quarterly from the Bureau. (Author)

**N65-12411** **Field 14B**
**CFSTI Prices: HC$3.00 MF$0.50**
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
**INITIAL PERFORMANCE STUDY OF THE UTIAS HIGH ENERGY MOLECULAR BEAM FACILITY,**
by D. R. O'Keefe. Aug 64, 58p Technical note no. UTIAS-TN-75
Grant NsG367
NASA CR-59667
Distribution: No limitation.

Descriptors: (*Molecular beams, Test facilities).

**N65-16440** **Field 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Hughes Research Labs., Malibu, Calif.
**RESEARCH ON GRAVITATIONAL MASS SENSORS,**
Status report no. 2, 15 Nov-15 Dec 64,
by R. L. Forward. 15 Dec 64, 2p
Contract NAS-1035
NASA CR-60595
Distribution: No limitation.

Descriptors: (*Weight, Measurement), (*Instrumentation, Weight).

**N65-16833** **Field 14B**
**CFSTI Prices: HC$1.00 MF$0.50**
Advanced Kinetics, Inc., Costa Mesa, Calif.
**LABORATORY SIMULATION STUDIES OF OUTER SPACE PHENOMENA,**
Quarterly status rept. no 1, 15 Apr - 15 Jul 63,
by H. J. Gilsdor, D. S. Harris, S. W. Lee, R. S. Lowder, and R. W. Waniek. 15 Jul 63, 12p
Contract NASW-702
NASA CR-50645
Distribution: No limitation.

Descriptors: (*Space environmental conditions, Simulation).

**N65-17213** **Field 14B**
**CFSTI Prices: HC$6.00 MF$1.50**
Marshall Labs., Torrance, Calif.
**PROTOTYPE SURVEYOR FLUXGATE MAGNETOMETER MODEL ML 125-1.**
Final engineering rept.,
by R. Carden, R. Kobayashi, C. Laws, H. Rosenberg, and D. Sassa. 14 Jun 62, 281p ML/TN-2000-70
Contracts NAS7 100, JPL950156
NASA CR-60762
Distribution: No limitation.

Descriptors: (*Magnetometers, Moon), (*Moon, Magnetic fields).

**N65-18486** **Field 14A**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Washington, D. C.
**NASA QUALITY REQUIREMENTS AND COST CONTROL,**
by Howard M. Weiss. 1964, 12p NASA-TM-X-56107
Distribution: No limitation.

Descriptors: (*Quality control, Scientific research), (*Costs, Control).

N65-20414 Field 14B, 22
CFSTI Prices: HC$4.00 MF$1.00
Geophysics Corp. of America, Bedford, Mass.
DEVELOPMENT OF COLD CATHODE IONIZATION GAUGES FOR SPACE VEHICLES. PART 1: RESEARCH AND DEVELOPMENT.
Final rept.,
by Wallace S. Kreisman. Nov 64, 143p GCA-TR-65-17-N
Contract NAS5-3353
NASA CR-57594
Distribution: No limitation.

Descriptors: (*Ionization gages, Cathodes), (*Spacecraft, Ionization gages).

N65-21761 Field 14B
CFSTI Prices: HC$3.00 MF$0.75
Apollo Support Dept., General Electric Co., Daytona Beach, Fla.
DEVELOPMENT OF IMPROVED SENSING METHODS AND DEVICES FOR STAGE CHECK-OUT. PART II. INFRARED MEASUREMENTS IN REAL TIME. VOLUME I: DESIGN STUDIES OF A REAL-TIME INFRARED MEASUREMENTS SYSTEM.
Final rept. for phase A, Jul 64-Jan 65.
15 Jan 65, 79p
Contract NAS8 11715
NASA CR-62237
Distribution: No limitation.

Descriptors: (*Checkout procedures, Infrared equipment), (*Infrared equipment, Checkout equipment).

N65-21771 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
Spaco, Inc., Huntsville, Ala.
MULTI-DEGREE OF FREEDOM OSCILLATOR.
Final rept.,
by John Melonas. 11 Mar 45, 15p
Contract NAS8 11565
NASA CR-62221
Distribution: No limitation.

Descriptors: (*Sloshing, Simulators), (*Oscillation, Instrumentation).

N65-23928 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
AVCO Corp., Tulsa, Okla.
PULSE COUNTING DETECTORS FOR LOW ENERGY PARTICLES AND HIGH ENERGY PHOTONS.
Bi-monthly rept., 10 Apr-10 Jun 64,
by J. E. Russell. 19 Jun 64, 16p
Contract NASw-783
NASA CR-62743 BMR-1
Distribution: No limitation.

Descriptors: (*Pulse counters, Particles), (*Photons, Pulse counters).

N65-25348 Field 14B
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
ANALYSIS OF WIND TUNNEL DATA FOR SEVERAL BECKMAN AND WHITELY SERIES 50 AND CLIMET MODEL C1-14 ANEMO-METERS.
Technical memo.,
by Dennis W. Camp. 28 May 65, 44p Rept. no. NASA-TM-X-53271
Distribution: No limitation.

Descriptors: (*Anemometers, Test methods).

N65-26045 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
Midwest Research Inst., Kansas City, Mo.
EXTREME VACUUM TECHNOLOGY INCLUDING CRYOSORPTION. DIFFUSION PUMP AND PRESSURE CALIBRATION STUDIES.
Quarterly status rept. no. 7, 1 Feb - 1 May 65,
by Paul J. Bryant and Charles M. Gosselin. 1965, 17p
Contract NASr63 (06),
Proj. MRI 2675P
NASA CR-63239
Distribution: No limitation.

Descriptors: (*Vacuum apparatus, Low-pressure research), (*Low-pressure research, Vacuum apparatus).

N65-35401 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
CONTACT-SURFACE TAILORING IN REAL SHOCK TUBES,
by Theodore A. Brabbs and Frank E. Belles. Oct 65, 15p NASA-TND-3043
Distribution: No limitation.

Descriptors: (*Shock tubes, Surface properties).

PB-168 697 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
Bureau of Naval Weapons, Washington, D. C.
ELECTRONIC HEIGHT GAGES.
Technical manual instrument calibration procedure, MD-05.
1 Sep 65, 11p NAVWEPS-17-20MD-05
Distribution: No limitation.

Descriptors: (*Meters, Calibration), Measurement, Instruction manuals, Test methods, Electronic equipment.

The manual describes the calibration verification of electronic height gages which consist of an indicator stand, a gage head, and an electronic amplifier-indicator unit. The Test Instrument is used to measure the differences in height between pairs of gage blocks, and the measured differences are compared with the known differences.

PB-168 779 Field 14C
CFSTI Prices: HC$1.00 MF$0.50
Boeing Co., Seattle, Wash. Aero-Space Div.
RECORDER MODEL 67-1200 (SANBORN COMPANY).
Technical manual instrument calibration procedure, AA-25.
1 Sep 65, 15p
Contract N123 (62861)35056A
NAVWEPS 17-20AA-25
Distribution: No limitation.

Descriptors: (*Recording systems, Calibration), Instruction manuals, Test methods.

The manual describes the calibration procedure for the Sanborn Company model 67-1200 recorder which consists of four stylus penmotors and one marker stylus.

PB-168 848 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
Metrology Engineering Center, Bureau of Naval Weapons Representative, Pomona, Calif.
VIBRATION METER, TYPE 1-117, (CONSOLIDATED ELECTRODYNAMICS CORP.)
Technical manual instrument calibration procedure, SV-01.
15 Jul 65, 15p NAVWEPS-17-20SV-01
Distribution: No limitation.

Descriptors: (*Vibration, Meters), (*Meters, Calibration), Voltmeters, Instruction manuals, Test methods.

The Consolidated Electrodynamics Corporation Type 1-117 vibration meter is a special purpose voltmeter designed to be used with one to four vibration pickups and calibrated in terms of velocity and displacement. This procedure describes the calibration of the Test Instrument in terms of voltage and frequency which are used to simulate the output of a calibrated vibration pickup.

## 16. MISSILE TECHNOLOGY

N65-23917 Field 16D
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
STATIC LONGITUDINAL STABILITY AND CONTROL CHARACTERISTICS AT A MACH NUMBER OF 2.01 OF A HYPERSONIC MISSILE CONFIGURATION HAVING ALL-MOVABLE WING AND TAIL SURFACES,
by Ross B. Robinson and Gerald V. Foster. 1 Apr 61, 29p NASA-TM-X-516
Distribution: No limitation.

Descriptors: (*Guided missiles, Stability).

N65-23919 Field 16D
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
LONGITUDINAL STABILITY AND CONTROL CHARAC- TERISTICS OF A WINGED AND A FLARED HYPERSONIC MISSILE CONFIGURATION WITH VARIOUS NOSE SHAPES AND FLARE MODIFICATIONS AT A MACH NUMBER OF 2.01,
by M. Leroy Spearman and Ross B. Robinson. Jun 62, 29p NASA-TM-X-693
Distribution: No limitation.

Descriptors: (*Guided missiles, Stability).

Patent 3,216,321 Field 16C
MULTI-RING DART WARHEAD.
Patent assigned to Air Force,
by Fay E. Null, Werner K. Kern and Fred E. Howard, Jr. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guided missile warheads, Rings), Guided missiles (Air-to-air), Guided missiles (Air-tosurface), Guided missiles (Surface-to-air), Patents.

The warhead is for use in self-propelled air-to-air, airto-ground, and ground-to-air missiles. The multi-ring dart warhead utilizes nearly the entire warhead weight for fragments, whereas the conventional warhead utilizes only about twenty-two percent of the total weight. The forward velocity of the multi-ring dart is obtained from the carrier's kinetic energy and the charge is only the expelling force. When fired the darts expand into a disc pattern.

Patent 3,217,599 Field 16A
MISSILE LAUNCHING APPARATUS.
Patent assigned to Navy,
by Delbert B. Meeker. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guided missile launchers, Inflatable structures), Floats, Oceans, Patents.

The apparatus is for use in launching a missile from a body of water. A plurality of inflatable buoyant chambers encircle the missile and press against the outer surface of the missile while it is being supported in launching position. The chambers are released and eject themselves from the missile during firing of the missile.

Patent 3,217,649 Field 16D
FUEL PRESSURIZATION SYSTEM.
Patent assigned to Navy,

by Walter W. Hagner. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guided missiles, Center of gravity), (*Fuels, Pressurization), Stabilization systems, Patents, Rocket motors, Ballast, Fuel tanks.

The fuel pressurization system is for use in an aerial missile for maintaining its center of gravity between prescribed limits. Two fuel tanks are arranged forward and aft in a missile, both tanks having expandable bladders therein which, when expanded by a pressurized gas, force fuel from the tanks. Admission of gas to the aft tank is controlled by an actuator operated normally closed check valve which acts to prohibit fuel withdrawal from the tank until the forward tank is empty and the pressure in the outlet fuel line begins to fall. Consequently, in addition to maintaining a nearly constant center of gravity within the fuel tanks, the system also sustains the fuel pressure level above that value required for rocket engine combustion.

**Patent 3,217,900** **Field 16A**
**MECHANISM FOR MISSILE TRANSFER.**
Patent assigned to Navy,
by Herman W. Kupetzky, Eugene D. Legg, and Howard J. Lauterbach. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guided missile launchers, Shipborne), Guided missiles, Handling, Ships, Patents.

The device is utilized for moving a missile in a vertical plane through an opening in the deck of a ship which has a lesser length than that of the missile. The structure includes an upper rail upon which the missile is positioned and a system of linkages which coact to selectively move the rail so that one end is raised or lowered relative to the other end to permit the rail to pass through the opening.

**PB-168 554** **Field 16B**
**CFSTI Prices: HC$3.00 MF$0.75**
Army Ballistic Missile Agency, Redstone Arsenal, Ala. Future Projects Analysis Branch.
**THE BI-ELLIPTICAL TRANSFER BETWEEN CIRCULAR COPLANAR ORBITS.**
Technical memo.,
by R. F. Hoelker and Robert Silber. 6 Jan 59, 59p ABMA-DA-TM-2-59
AD 224 736
Distribution: No limitation.

Descriptors: (*Transfer trajectories, Circular orbit trajectories), Guided missile trajectories, Elliptical orbit trajectories.

This note investigates the area of relative altitudes of coplanar circular orbits about the earth for which a bielliptical transfer is more economical than the classical Hohmann transfer. It is found that for transfers between orbits apart by radii-ratios larger than 15.582, the Hohmann transfer is less economic than a bi-elliptical transfer with an intermediate point of altitude larger than that of the larger terminal orbit. The implications of these findings are indicated. (Author)

**PB-168 672** **Field 16B, 14E**
**CFSTI Prices: HC$3.00 MF$0.75**
RCA Service Co., Patrick AFB, Fla.
**RCA DATA REDUCTION TECHNICAL REPORT. FIXED CAMERA DATA REDUCTION ANALYSIS PROCEDURES.**
Technical rept.,
by George H. Rosenfield. 1 Feb 58, 69p RCA Data Reduction TR-41
AFMTC TR-5-2;
AD 134 271
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Guided missile trajectories, Data), (*Ballistic cameras, Guided missile trajectories), Operations research, Tracking cameras.
Identifiers: CZR-1 cameras.

This report compiles in a single volume the mathematical development of the analysis procedures in use at the Air Force Missile Test Center to reduce missile trajectory data from CZR-1 Bowen Ribbon Frame Camera film records. The steps to the data reduction procedures are: (1) Monitoring and correcting of CZR-1 camera film readings (2) Fixed camera orientation (3) Fixed camera triangulation (4) Atmospheric refraction correction (5) Smoothed position, velocity, and acceleration and (6) Attitude reduction. The procedures are also applicable to certain other fixed camera instrumentation systems. (Author)

## 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

**AD-288 099** **Field 17B, 9B**
**CFSTI Prices: HC$6.00**
Radio Corp. of America, Camden, N. J. Digital Communication Equipment Engineering.
**VOICE TO TELETYPE CODE CONVERTER RESEARCH PROGRAM. PART II. EXPERIMENTAL VERIFICATION OF A METHOD TO RECOGNIZE PHONETIC SOUNDS.**
Technical rept. for Oct 61-Jun 62,
by W. F. Meeker, A. L. Nelson and P. B. Scott. Sep 62, 217p
Contract AF33 (616)-6691,
Proj. AF-4335,
Task 433519
ASD TR-61-666-Pt-2
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Speech recognition, Teletype systems), (*Teletype systems, Speech recognition), Data processing systems, Speech representation, Programming (Computers), Digital systems, Acoustic filters.

Speech-to-teletype code conversion oriented toward automatic recognition of phonetic units corresponding to phonemes is studied. Speech, analyzed by an 18-channel filter bank and converted to digital form for analysis with an RCA 501 Data Processing System, was studied to derive consonant recognition criteria. Moderate success was achieved in the recognition of 10 consonants and grouping of 8 additional consonants into classes. The consonant recognition program provided completely automatic location and recognition of the initial consonants with a mean accuracy of 60% for ten male talkers speaking isolated CVC words made up of all combinations of these initial consonants, ten vowels, and the final consonant d. A preliminary design of a speech recognizer based upon these studies is included. (Author)

**AD-465 366** **Field 17I, 5I, 17D**
**CFSTI Prices: HC$1.00 MF$0.50**
Navy Electronics Lab., San Diego, Calif.
**A MULTIPLE-SIGNAL ENVIRONMENT SIMULATOR (MICROWAVE).**
Research and development rept. Dec 61-Jun 64,
by V. J. Meyers. 4 May 65, 20p NEL-1284
Proj. SS-316-001,
Tasks 9275, NEL-G20551
Distribution: No limitation.

Descriptors: (*Radar signals, Simulators), (*Electromagnetic warfare, Training devices), Naval training, Radar interception, Radar operators, Radar trainers, S band, X band, Radar equipment, Microwave equipment, Video signals.

A new equipment was designed and constructed as a research tool for simulating radar signals in S and X bands and at video frequencies. Parts of the simulator were used successfully in mock-up tests of the Ships Integrated Electronic Warfare System (Sinews) at FAAWTC. Operator training and Sinews performance tests were included.

**AD-466 889** **Field 17G**
**CFSTI Prices: HC$6.00 MF$1.25**
Naval Air Development Center, Johnsville, Pa. Aeronautical Instruments Lab.
**INERTIAL SENSORS PERFORMANCE PARAMETERS. PHASE IV: GYRO LABORATORY MANUAL,**
by K. L. Bachman and J. B. Messmer. 17 Dec 64, 208p Rept. no. NADC-AI-6450
Task RAV07J002/2021/F002-13-02
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Gyroscopes, Test methods), Inertial navigation, Inertial guidance, Stabilized platforms, Instruction manuals, Performance (Engineering).

This manual provides a standardized test procedure and method of analysis for gyro evaluation, so that performance characteristics may be compared between gyros of various types.

**C13.46:324** **Field 17G, 20N**
**CFSTI Prices: HC$0.30 MF$0.50**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**INTERFERENCE PREDICTIONS FOR THE INSTRUMENT LANDING SYSTEM.**
Technical note,
by G. D. Gierhart and M. E. Johnson. Sep 65, 50p
NBS TN-324
Availability: Hard copy available from Superintendent of Documents, Washington, D. C., 20402, $0.30.

Descriptors: (*Instrument landings, Radiofrequency interference), (*Radiofrequency interference, Instrument landings), Very high frequency, Radio signals, Attenuation, Signal-to-noise ratio, Mathematical prediction, Radio navigation, Air traffic control terminal areas.

Co-channel and adjacent-channel interference predictions for the Instrument Landing System are presented in this report. Information on the various types of ground facilities involved is given first. Propagation mechanisms applicable to the 108 to 112 Mc/s frequency range are discussed second together with the calculation of transmission loss and its variability. Third, the statistical treatment of interference problems is explained. Finally, the results of the study are presented as curves of normalized desired-toundesired signal strength ratios versus distance from the desired station. Aircraft altitudes of 1,000, 6,250, 12,000, and 18,000 feet along with station separations ranging from 20 to 330 nautical miles were considered. Detailed procedures, mathematical formulas, and computer programs used are discussed in the Appendices. (Author)

**N65-15405** **Field 17G, 22A**
**CFSTI Prices: HC$1.00 MF$0.50**
Douglas Aircraft Co., Inc., Santa Monica, Calif. Missile and Space Systems Div.
**AN ELECTROMECHANICAL CONING DAMPER, REBOUND PROJECT, MODEL DSV-5,**
by A. D. Shvetzoff. Jan 62, 15p SM-41393
Contract NAS5-1294
NASA CR-60341
Distribution: No limitation.

Descriptors: (*Damping, Inertial guidance), (*Inertial guidance, Space flight).

**N65-17956** **Field 17B**
**CFSTI Prices: HC$2.00 MF$0.50**
Space Craft, Inc., Huntsville, Ala.
**AROD TRANSPONDER; THEORY OF OPERATION.**
Jun 64, 50p
Contract NAS8 5480
NASA CR-60988
Distribution: No limitation.

Descriptors: (*Transponders, Operation).

**N65-19864** **Field 17B, 20F**
**CFSTI Prices: HC$3.00 MF$0.75**
Philco, Blue Bell, Pa. Research Labs.
**MODULATION INDUCING RETRODIRECTIVE OPTICAL SYSTEM.**
Technical rept. for 21 May 63-20 May 64,
by Boyd Harned. Sep 64, 70p
Contract NASw721
NASA CR-57461
Distribution: No limitation.

Descriptors: (*Optical equipment, Communication systems), (*Communication systems, Optical equipment).

**N65-20112** **Field 17B, 22B**
**CFSTI Prices: HC$3.00 MF$0.75**
Hughes Research Labs., Malibu, Calif.
**MULTIPLE ACCESS SATELLITE COMMUNICATION.**
Final rept., 20 Aug 62-20 Aug 63,
by S. G. Lutz. 20 Aug 63, 74p
Contract NASw-495
NASA CR-57530
Microfilmed from best available copy. Distribution: No limitation.

Descriptors: (*Communication satellites (Active), Multiplex).

**N65-35067** **Field 17C, 6D**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**AN ELECTRONIC MEANS OF PROVIDING BINAURAL INDICATION OF THE DIRECTION OF RADIO TRANSMISSIONS,**
by Ray A. Torrey and Gilbert G. Robinson. Oct 65, 15p NASA TND-3062
Distribution: No limitation.

Descriptors: (*Direction finding, Bionics), (*Bionics, Direction finding).

**Patent 3,217,146** **Field 17G, 9B**
**NAVIGATION COORDINATE PRESENTATION COMPUTER.**
Patent assigned to Navy,
by Wesley A. Fails. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Navigation computers, Tracking), Airborne, Underwater tracking, Seromechanisms.

The computer may be used to present tracking and navigation information, for instance, an airplane's position with respect to a submarine being tracked. The computer consists of three basic servo channels. Two of the servos are used to present the position of the tracking vehicle and object being tracked. The third servo is used to change the position of the reference coordinates.

**Patent 3,217,320** **Field 17I, 5H**
**MANUAL PROBE TRACKING SYSTEM.**
Patent assigned to Navy,
by John DiPerry. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Radar tracking, Radar operators), Systems engineering, Patents.

The manual-aid is for the acquisition and tracking control system of a tracking radar. The system includes a resistance wire, across which is applied maximum range tracking voltage, positioned in front of a range scope. A manual probe connected to the range tracking detector enables the operator to pick off the wire a voltage corresponding to the gating voltage for that point on the scope trace. It provides instantaneous and accurate positioning of the radar tracking gate, or gates, at any point within a selected range segment upon the operator's command.

**Patent 3,217,322** **Field 17I**
**F. M. RADAR SYSTEM.**
Patent assigned to AEC,
by Louis J. Kabell and Conrad W. Roeschke. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Radar equipment, Range finding), (*Frequency modulation, Radar equipment), Patents.

The system is useful where it is desired to indicate the attainment of a preselected distance from an object or to determine the distance of an object at any time. The system includes a radar transmitter, a modulator such as a multivibrator, three mixers, a local oscillator, an amplifier and an indicating circuit.

**Patent 3,217,326** **Field 17I, 22B**
**SPACE SURVEILLANCE SYSTEM WITH INSTANTANEOUS RESOLUTION OF MULTIPLE CYCLE PHASE AMBIGUITY.**
Patent assigned to Navy,
by Maxime G. Kaufman and Donald W. Lynch. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Space surveillance systems, Radio interferometers), (*Radio interferometers, Space surveillance systems), Phase measurement, Patents.

The interferometer is for measuring the direction of arrival of electromagnetic wave energy. A method of combining signals from interferometer antenna pairs is provided, wherein the signals from the pairs are placed in phase carrier frequency relationships corresponding to the spacing of the antenna pairs producing them, converted to pulses of approximately 0.4 duty cycle, and then combined to derive an output indication when the pulse signals achieve coincidence. This indication is dependent upon and characteristic of the direction of arrival of incoming electromagnetic wave energy.

**PB-168 602** **Field 17C, 22B, 8E**
**CFSTI Prices: HC$3.00 MF$0.75**
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
**RADIO DOPPLER METHOD OF USING SATELLITES FOR GEODESY, NAVIGATION AND GEOPHYSICS WITHIN THE PLANETARY SYSTEM,**
by A. M. Stone and G. C. Weiffenbach. Jan 61, 83p TG-385
Contract NOrd-7386
AD 252 803
Distribution: No limitation.

Descriptors: (*Doppler systems, Satellite tracking systems), (*Satellite tracking systems, Doppler systems), Tracking, Satellites (Artificial), Radio transmitters, Doppler effect, Doppler navigation, Geodesics, Geophysics.

**PB-168 753** **Field 17B, 9D**
**CFSTI Prices: HC$3.00 MF$0.75**
Armour Research Foundation, Chicago, Ill.
**METHODS OF COMPARISON AND EVALUATION OF COMMUNICATION SYSTEMS,**
by L. Valcik and J. E. McManus. 26 Jul 60, 89p
Contract AF30 (602)-2074,
Proj. ARF-E123
RADC TN-60-187;
AD 244 887
Distribution: No limitation.

Descriptors: (*Communication systems, Value engineering), (*Information theory, Radio communication systems), Radio waves, Propagation, Amplitude modulation, Frequency modulation, Pulse modulation, Demodulators, Digital systems, Data transmission systems, Ionospheric propagation.

The purpose of this contract is the performance of an investigation and study leading to the development of methods for comparing and evaluating long-range point-to-point communication systems. This technical note summarizes the initial stage of a review of factors affecting the choice of modulation for use with the various propagation modes. Included are: (1) a brief discussion of methods of comparing communication systems, (2) a review of AM, FM, and PM principles, (3) discussion of matched filters and correlation detectors, and (4) a short summary of propagation effects on some types of signals. The main emphasis of the report is on the theoretical performance of digital AM, FSK, and PSK systems under certain non-fading and fading conditions. An extensive list of references is included. (Author)

## 18. NUCLEAR SCIENCE AND TECHNOLOGY

**ACNP-63592** **Field 18I**
**CFSTI Prices: HC$1.00 MF$0.50**
Allis-Chalmers Mfg. Co., Washington, D. C. Nuclear Power Dept.
**LARGE FAST REACTOR DESIGN STUDY.**
Monthly rept.
Aug 63, 8p
Contract AT (11-1)-1316
Distribution: No limitation.

Descriptors: (*Fast reactors, Design).

**ACNP-64519 (rev)** **Field 18L, 18E**
**CFSTI Prices: HC$1.00 MF$0.50**
Allis-Chalmers Mfg. Co., Bethesda Md. Atomic Energy Div.
**METHODS FOR CALCULATION OF THE ELK RIVER REACTOR FUEL INVENTORY,**
by Marion L. Kennedy, Chieh Ho, and Edward D. Kendrick. 15 Feb 65, 19p
Contract AT (11-1)-654
Distribution: No limitation.

Descriptors: (*Reactor fuels, Nuclear power plants), (*Nuclear power plants, Reactor fuels).

**AGN-TM-410** **Field 18L, 18E**
**CFSTI Prices: HC$6.00 MF$1.25**
Aerojet-General Nucleonics, San Ramon, Calif.
**ARMY GAS-COOLED REACTOR SYSTEMS PROGRAM. ML-1 THERMODYNAMIC PERFORMANCE TEST (ANSOP 16650).**
Final test rept.
May 65, 205p
Contract AT (10-1)-880
Distribution: No limitation.

Descriptors: (*Gas-cooled reactors, Thermodynamics), (*Nuclear power plants, Thermodynamics).

**AP-NOTE-371** **Field 18K, 18L**
**CFSTI Prices: HC$2.00 MF$0.50**
Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
**EXPERIMENTAL AND THEORETICAL ANALYSIS OF THE INTEGRATED FAST NEUTRON FLUX IN THE SM-1,**
by E. F. Clancy and D. N. Ferguson. 21 Jul 61, 44p
Contract AT (30-1)-2639
Distribution: No limitation.

Descriptors: (*Neutron flux, Fast neutrons), (*Pressurized water reactors, Neutron flux).

**AP-NOTE-422** **Field 18K**
**CFSTI Prices: HC$1.00 MF$0.50**
Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
**SPATIAL AVERAGES OF DIFFUSION COEFFICIENTS,**

by R. L. Murray. 20 Jun 62, 24p
Contract AT (30-1)-2639
Distribution: No limitation.

Descriptors: (*Neutron transport theory, Nuclear reactors).

**AP-NOTE-444** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
**REACTORS WITH MIXED NATURAL AND HIGHLY ENRICHED URANIUM,**
by Raymond L. Murray. 6 Jul 62, 25p
Contract AT (30-1)-2639
Distribution: No limitation.

Descriptors: (*Enriched fuel reactors, Uranium), (*Reactor fuels, Enriched fuel reactors).

**APEX-681** **Field 18J, 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
**IRON-CHROMIUM-ALUMINUM-YTTRIUM ALLOYS FOR CLADDING APPLICATIONS TO 2400 DEG. F.**
by J. P. Collins and N. McConnaughey. 12 Jun 61, 28p
Contract AT (11-1)-171
Distribution: No limitation.

Descriptors: (*Reactor fuel cladding, Iron alloys), (*Iron alloys, Reactor fuel cladding), Yttrium alloys, Chromium alloys, Aluminum alloys.

**BAW-1280-23** **Field 18L**
**CFSTI Prices: HC$3.00 MF$0.75**
Babcock and Wilcox Co., Barberton, Ohio. Boiler Div.
**SODIUM-HEATED STEAM GENERATOR DEVELOPMENT.**
Progress rept. no. 21, Jan 65.
Jan 65, 57p
Contract AT (11-1)-1280
Distribution: No limitation.

Descriptors: (*Nuclear power plants, Design).

**BAW-3466-1** **Field 18J, 18L**
**CFSTI Prices: HC$4.00 MF$1.00**
Babcock and Wilcox Co., Lynchburg, Va.
**ZERO POWER TESTS, SM-1A CORE III,**
by M. L. Batch, R. M. Ball, and R. H. Lewis. Apr 65, 139p
Contract AT (30-1)-3466
Distribution: No limitation.

Descriptors: (*Reactor cores, Pressurized water reactors), (*Power reactors, Reactor cores).

**BDX-613-71** **Field 18D, 9A**
**CFSTI Prices: HC$3.00 MF$0.75**
Bendix Corp., Kansas City, Mo.
**A SLOW TIME BASE READOUT SYSTEM FOR NON- REPETITIVE PULSE ANALYSIS,**
by Carl E. Thomson. May 65, 91p
Contract AT (29-1)-613
Distribution: No limitation.

Descriptors: (*Radiation measurement systems, Circuits), (*Circuits, Radiation measurement systems).

**BMI-X-10132** **Field 18G, 11F, 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle Memorial Inst., Columbus, Ohio.
**FISSION-PRODUCT REACTIONS WITH AND RELEASE FROM FUEL-ELEMENT CLADDINGS.**
Quarterly progress rept., Apr-Jun 65,
by Duane N. Sunderman, David I. Morrison, and James E. Howes, Jr. 1 Jul 65, 14p BMI-X-10132
Contract W-7405-eng-92
EURAEC 1427
Distribution: No limitation.

Descriptors: (*Reactor fuel cladding, Fission products), (*Fission products, Reactor fuel cladding).

**BMI-X-10134** **Field 18J, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle Memorial Inst., Columbus, Ohio.
**FISSION-FRAGMENT EFFECTS IN STRUCTURAL MATERIALS.**
Quarterly progress rept. for Apr - Jun 65,
by Robert L. Ritzman, Neal M. Griersenauer, and Edward J. Jablonowski. 1 Jul 65, 10p EURAEC-1426
Contract W-7405-eng-92
Distribution: No limitation.

Descriptors: (*Radiation dmage, Metals).

**BNL-9007** **Field 18J, 18I**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**COUNTERCURRENT REFUELLING IN THE ORDERED BED FAST REACTOR,**
by W. E. Winsche, J. Chernick, L. G. Epel, L. Green, and M. M. Levine. Mar 65, 6p CONF-650602-22
Contract AT (30-2)-GEN-16
Presented at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn. Distribution: No limitation.

Descriptors: (*Fast reactors, Breeder reactors), (*Reactor fuel processing, Fast reactors).

**BNL-9086** **Field 18I, 18J**
**CFSTI Prices: HC$2.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**HIGH FLUX IRRADIATION FACILITY STUDY. PROPOSED CONVERSION OF BGRR TO D2O COOLED, PRESSURE TUBE TYPE REACTOR,**
by K. C. Hoffman, G. Lellouche, G. Ahlers, andD. Thompson. 1964, 39p
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Graphite moderated reactors, Research reactors), (*Heavy water reactors, Neutron flux).

**BNL-9146** **Field 18D**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**LARGE HYDROGEN BUBBLE CHAMBER DESIGN,**
by R. B. Palmer. 31 Mar 65, 15p CONF-650111-5
Contract AT (30-2)-GEN-16
Presented at Cern Informal Neutrino Conference, Geneva. Distribution: No limitation.

Descriptors: (*Bubble chambers, Hydrogen), (*Hydrogen, Bubble chambers).

**BNL-9218** **Field 18D**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**RECENT DEVELOPMENTS IN HIGH ENERGY COUNTERS,**
by Luke C. Yuan. 12 May 65, 18p CONF-650510-4
Contract AT (30-2)-GEN-16
Prepared for presentation at Purdue Conference on Instrumentation for High Energy Physics, Lafayette, Ind., 12-14 May 1965. Distribution: No limitation.

Descriptors: (*Radiation measurement systems, Charged particles).

**BNL-9237** **Field 18I**
**CFSTI Prices: HC$2.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**HFBR CONTAINMENT TEST, APRIL 9, 10, 1965,**
by P. R. Tichler. Jun 65, 32p
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Nuclear reactors, Containment).

**BNL-9279** **Field 18I, 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**FUEL MANAGEMENT IN THE SETTLED BED FAST REACTOR,**
by L. Green, M. M. Levine, W. E. Winsche, L. G. Epel, and J. Chernick. Jun 65, 8p CONF-650602-29
Contract AT (30-2)-GEN-16
Presented at American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn., 21-24 Jun 1965. Distribution: No limitation.

Descriptors: (*Fast reactors, Reactor fuels), (*Reactor fuels, Fast reactors).

**BNL-9290** **Field 18H, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**AN ELECTRON TRANSMISSION STUDY OF DEFECTS IN NEUTRON-IRRADIATED IRON,**
by Joseph S. Bryner. 1962, 7p CONF-650904-9
Contract AT (30-2)-GEN-16
Presented at Symposium on Radiation Effects, Asheville, N. C. Distribution: No limitation.

Descriptors: (*Iron, Radiation damage), (*Radiation damage, Electron microscopy).

**BNWL-C-3** **Field 18L, 18I**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**HANFORD STUDIES EXECUTED FOR THE USAEC-AECL COOPERATIVE PROGRAM ON DEVELOPMENT OF HEAVY WATER MODERATED POWER REACTORS.**
Monthly progress rept. for Dec 64,
by F. W. Albaugh. 14 Jan 65, 4p
Contract AT (45-1)-1830
Distribution: No limitation.

Descriptors: (*Power reactors, Design), (*Heavy water reactors, Design).

**BNWL-SA-121** **Field 18D, 7E**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**AN INCREMENTAL DATA RECORDING SYSTEM FOR LOW LEVEL SPECTROMETRY,**
by F. P. Brauer, R. E. Connally, and J. H. Kaye. 1 Mar 65, 22p CONF-650401-6
Contract AT (45-1)-1830
Prepared for presentation to American Chemical Society, Detroit. Distribution: No limitation.

Descriptors: (*Radiochemistry, Data processing systems), (*Data processing systems, Radiochemistry).

**BNWL-SA-141** **Field 18J, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**TUNGSTEN FIBER REINFORCED NICKEL COMPOSITES,**
by R. K. Robinson and P. L. Farnsworth. 15 Mar

65, 23p CONF-650419-2
Contract AT (45-1)-1830
Meeting of Refractory Composites Working Group, Atlanta. Distribution: No limitation.

Descriptors: (*Nickel, Composite materials), (*Reactor fuel cladding, Nickel), (*Tungsten, Reinforcing materials).

**BNWL-SA-163** **Field 18D**
**CFSTI Prices: HC$2.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**NEUTRON FLUX SENSOR DEVELOPMENTS,**
by D. C. Worlton. 15 Apr 65, 29p CONF-650526-1
Contract AT (45-1)-1830
Prepared for presentation at Tripartite Instrumentation Conference (7th), London. Distribution: No limitation.

Descriptors: (*Neutron flux, Monitors).

Identifiers: Sensors (Instrumentation).

**BNWL-SA-2** **Field 18J, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**SMALL SPECIMENS, SUITABLE FOR IRRADIATION DAMAGE STUDIES ON REACTOR STRUCTURAL MATERIALS,**
by R. G. Hoagland. 4 Jan 65, 17p CONF-650114-1
Contract AT (45-1)-1830
Prepared for presentation to American Society for Testing Materials Meeting, Washington, D. C. Distribution: No limitation.

Descriptors: (*Reactor materials, Radiation damage).

**BNWL-SA-236** **Field 18H, 11F**
**CFSTI Prices: HC$3.00 MF$0.75**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**RADIATION DAMAGE IN HEXAGONAL CLOSE- PACKED METALS AND ALLOYS,**
by A. L. Bement. 1 Jun 65, 63p CONF-650904-7
Contract AT (45-1)-1830
Presented at Symposium on Radiation Effects, Asheville, N. C. Distribution: No limitation.

Descriptors: (*Metals, Radiation damage), (*Alloys, Radiation damage), (*Radiation damage, Metals).

**BNWL-SA-76** **Field 18J, 18I**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**DISASSEMBLY AND SAMPLING OF IRRADIATED MATERIALS IN THE UNITED STATES.**
Paper communication no. 23,
by C. L. Boyd, E. C. Watts, E. M. King andS. E. Dismuke. 1 Mar 65, 17p CONF-650604-7
Contract AT (45-1)-1830
Presented at International Symposium on Working Methods in High Activity Hot Labs., Grenoble, France. Distribution: No limitation.

Descriptors: (*Reactor fuel processing, Remote control systems), (*Reactor materials, Reactor inspection).

**BNWL-SA-79** **Field 18F**
**CFSTI Prices: HC$2.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**NEUTRON ATTENUATION MECHANISMS IN CONCRETES,**
by J. Greenborg. 3 Jun 65, 47p CONF-650602-38
Contract AT (45-1)-1830
Prepared for presentation to American Nuclear Society 11th annual meeting, Gatlinburg, Tenn. Distribution: No limitation.

Descriptors: (*Concrete, Neutron absorption), (*Neutrons, Attenuation).

**BNWL-SA-97** **Field 18J, 18I**
**CFSTI Prices: HC$2.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**HIGH VOLUME NONDESTRUCTIVE TEST APPLICATIONS AT THE HANFORD ATOMIC PRODUCTS OPERATION,**
by D. C. Worlton. 11 Mar 65, 29p CONF-650509-5
Contract AT (45-1)-1830
Presented at IAEA Symposium on Nondestructive Testing in Nuclear Technology, Bucharest. Distribution: No limitation.

Descriptors: (*Non-destructive testing, Nuclear engineering).

**BNWL-104** **Field 18I, 18J**
**CFSTI Prices: HC$3.00 MF$0.75**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**MINIMIZED FUEL CYCLE COST FOR A SIMULATED PRESSURIZED WATER REACTOR. PART I,**
by D. E. Deonigi, P. A. Horton, and A. F. McConiga. Apr 65, 89p
Contract AT (45-1)-18830
Distribution: No limitation.

Descriptors: (*Pressurized water reactors, Reactor fuel processing).

**BNWL-61** **Field 18K**
**CFSTI Prices: HC$3.00 MF$0.75**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**ICEDT: AN EXPONENTIAL DATA ANALYSIS CODE,**
by D. D. Matsumoto. Apr 65, 65p
Contract AT (45-1)-1830
Distribution: No limitation.

Descriptors: (*Programming (Computers), Reactor lattice parameters).

**COO-1233-19** **Field 18A, 20I**
**CFSTI Prices: HC$1.00 MF$0.50**
Wisconsin Univ., Madison. Dept. of Physics.
**THERMONUCLEAR PLASMA STUDIES.**
Quarterly status rept. no. 8, Oct 31, 64-Jan 31, 65.
31 Jan 65, 8p
Contract AT (11-1)-1233
Distribution: No limitation.

Descriptors: (*Plasma physics, Thermonuclear reactions), (*Thermonuclear reactions, Control).

**COO-1233-20** **Field 18A, 20I**
**CFSTI Prices: HC$1.00 MF$0.50**
Wisconsin Univ., Madison. Dept. of Physics.
**THERMONUCLEAR PLASMA STUDIES.**
Quarterly status rept. no. 9.
30 Apr 65, 17p
Contract AT (11-1)-1233
Distribution: No limitation.

Descriptors: (*Thermonuclear reactions, Plasma physics), (*Plasma physics, Thermonuclear reactions).

**CVNA-195** **Field 18L**
**CFSTI Prices: HC$2.00 MF$0.50**
Westinghouse Electric Corp. Atomic Power Div., Pittsburgh.
**CAROLINAS VIRGINIA NUCLEAR POWER ASSOCIATES, INC. RESEARCH AND DEVELOPMENT PROGRAM.**
Quarterly Progress rept. Jul-Sep 63.
1946, 43p
Contract AT (30-1)-2289
Distribution: No limitation.

Descriptors: (*Power reactors, Heavy water reactors).

**DLCS-5680301** **Field 18D**
**CFSTI Prices: HC$1.00 MF$0.50**
Duquesne Light Co., Shippingport, Pa.
**REACTOR PLANT CONTAINER INTEGRITY TESTS. (BUTTERFLY VALVE HYDRAULIC SYSTEM TEST). TEST EVALUATION.**
2 Mar 65, 16p
Contract AT (11-1)-292
Distribution: No limitation.

Descriptors: (*Reactor safety systems, Hydraulic systems), (*Butterfly valves, Reactor safety systems).

**EURAEC-1384** **Field 18D**
**CFSTI Prices: HC$3.00 MF$0.75**
Centre d'Etude de l'Energie Nucleaire, Mol (Belgium).
**SOLID STATE NEUTRON DETECTOR.**
Final rept. no. 2, 1 Oct 63-30 Sep 64.
1964, 64p EUR-2347
Contract 039-63-10-RDB
Distribution: No limitation.

Descriptors: (*Neutron detectors, Semiconductor devices), (*Semiconductor devices, Neutron detectors).

**GA-5924** **Field 18I, 18L**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**40-MW (E) PROTOTYPE HIGH-TEMPERATURE GASCOOLED REACTOR POSTCONSTRUCTION RESEARCH AND DEVELOPMENT PROGRAM.**
Summary progress rept for 31 Oct 64.
15 Dec 64, 16p
Contract AT (04-3)-314
Distribution: No limitation.

Descriptors: (*Gas-cooled reactors, Reactor operation), (*Reactor operation, Gas-cooled reactors).

**GA-6367** **Field 18I, 18J**
**CFSTI Prices: HC$2.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**THE USE OF LOW-ENRICHMENT URANIUM AND PLUTONIUM IN THE HTGR,**
by S. Jaye, P. U. Fischer and D. H. Lee, Jr. 7 May 65, 29p CONF-650606-7
Contract AT (04-3)-167
Presented at Euratom Symposium on Fuel Cycles of High-Temperature Gas-Cooled Reactors, Brussels. Distribution: No limitation.

Descriptors: (*Gas-cooled reactors, Reactor fuels), (*Reactor fuels, Economics).

**GA-6399** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**FUEL FABRICATION TECHNIQUES FOR HIGH TEMPERATURE GAS-COOLED REACTOR FUELS,**
by D. V. Ragone. 7 May 65, 18p CONF-650506-8
Contract AT (04-3)-167
Prepared for presentation at Euratom Symposium on fuel cycles of high-temperature gas-cooled reactors, Brussels. Distribution: No limitation.

Descriptors: (*Gas-cooled reactors, Reactor fuel processing), (*Reactor fuel processing, Gas-cooled reactors).

**GA-6406** **Field 18I, 18L**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**40-MW (E) PROTOTYPE HIGH-TEMPERATURE GAS-COOLED REACTOR POST CONSTRUCTION RESEARCH AND DEVELOPMENT PROGRAM.**
Quarterly progress rept. for the period ending 30 Apr 65.
31 May 65, 25p
Contract AT (04-3)-314
Distribution: No limitation.

Descriptors: (*Gas-cooled reactors, Reactor operation), (*Reactor operation, Gas-cooled reactors).

**GAMD-5434** **Field 18I, 18K**
**CFSTI Prices: HC$3.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**GENERAL ATOMIC IN-PILE LOOP FISSION PRODUCT TRAPPING SYSTEM REGENERATIVE H20-C02 TRAP AND LIQUID NITROGEN COOLED NO. 2 CHARCOAL TRAP ASSEMBLY INFORMATION DATA PACKAGE AND DESIGN ANALYSIS,**
by R. J. Kiefer and E. O. Winkler. 6 Jul 64, 55p
Contract AT (04-3)-167,
Proj. 315.000
Distribution: No limitation.

Descriptors: (*Fission product activity, Reactor coolants), (*Reactor coolants, Fission product activity).

**GAMD-5958** **Field 18I**
**CFSTI Prices: HC$2.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**GENERAL ATOMIC IN-PILE LOOP PLATEOUT ANALYSES: CYCLES 35 THROUGH 41, JULY-SEPTEMBER 1963,**
by L. R. Zumwalt and D. D. Busch. 17 Apr 63, 32p
Contract AT (04-3)-167
Distribution: No limitation.

Descriptors: (*Reactor system components, Fission products), (*Fission products, Reactor kinetics).

**GAMD-6321** **Field 18G, 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied science.
**THE RELEASE OF CONDENSABLE FISSION PRODUCTS FROM THE GAIL III-B FUEL ELEMENT,**
by L. R. Zumwalt and D. D. Busch. 19 Apr 65, 16p
Contract AT (04-3)-16,
Proj. 317
Distribution: No limitation.

Descriptors: (*Reactor fuel elements, Fission products), (*Fission products, Reactor fuel elements).

**GEAP-4580** **Field 18K, 18L, 9B**
**CFSTI Prices: HC$3.00 MF$0.75**
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
**FLUZ--A COMPUTER CODE FOR ANALYZING THE REACTOR RESPONSE TO SMALL REACTIVITY OSCILLATIONS,**
by P. Greebler, B. A. Hutchins and M. D. Kelley. 22 Mar 65, 51p
Contract AT (04-3)-189
Distribution: No limitation.

Descriptors: (*Power reactors, Reactor kinetics), (*Programming (Computers), Reactor kinetics).

**GEAP-4754** **Field 18J**
**CFSTI Prices: HC$2.00 MF$0.50**
General Electric Co., San Jose, Calif. Atomic Power Equipment.
**TENSILE PROPERTIES OF FUEL CLAD MATERIALS IRRADIATED IN SUPERHEAT ENVIRONMENTS,**
by B. C. Beaudreau, H. J. Busboom, andF. A. Comprelli. Apr 65, 42p
Contract AT (04-3)-189
Distribution: No limitation.

Descriptors: (*Reactor fuel cladding, Tensile properties), (*Reactor materials, Reactor fuel cladding).

**GEAP-4781** **Field 18K**
**CFSTI Prices: HC$1.00 MF$0.50**
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
**PLUTONIUM SUBCRITICAL EXPERIMENT PROGRAM.**
Quarterly rept. no. 2, 1 Oct-31 May 64,
by J. G. Carver. 8 Jan 65, 15p EURAEC-1311
Contract AT (04-3)-189
Distribution: No limitation.

Descriptors: (*Subcritical assemblies, Plutonium).

**GEAP-4790** **Field 18L**
**CFSTI Prices: HC$5.00 MF$1.00**
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
**NUCLEAR SUPERHEAT PROJECT.**
Quarterly rept. no. 22, Nov 64-Jan 65,
by W. L. Flock. Feb 65, 163p
Contract AR (04-3)-189
Distribution: No limitation.

Descriptors: (*Power reactors, Heating).

**GEAP-4805** **Field 18K, 18J, 9B**
**CFSTI Prices: HC$4.00 MF$0.75**
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
**MANIA-MIXING ANALYZED NODAL THERMALHYDRAULIC ANALYSES,**
by S. F. Armour and D. L. Smith. Feb 65, 108p
Contract AT (04-3)-189
Distribution: No limitation.

Descriptors: (*Reactor coolants, Thermal properties), (*Gas flow, Reactor coolants).

**GEAP-4843** **Field 18K, 20M**
**CFSTI Prices: HC$1.00 MF$0.50**
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
**TRANSITION BOILING HEAT TRANSFER PROGRAM.**
Quarterly progress rept. no. 9,
by E. P. Quinn. 1 Apr 65, 15p EURAEC-1372
Contract AT (04-3)-189
Distribution: No limitation.

Descriptors: (*Boiling, Heat transfer), (*Reactor kinetics, Heat transfer).

**GEAP-4899** **Field 18D**
**CFSTI Prices: HC$5.00 MF$1.00**
General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
**FINAL SAFEGUARDS REPORT FOR GARIGLIANO DEVELOPMENT PROGRAM,**
by C. L. Howard, F. Santasilia, S. Viscuso, A. Colling and T. Sorlie. 1 Jun 65, 186p EURAEC-1411
Contract AT (04-3)-189
Distribution: No limitation.

Descriptors: (*Reactor safety systems, Test methods).

**GEMP-338** **Field 18L**
**CFSTI Prices: HC$1.00 MF$0.50**
General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
**UTILIZATION OF A ONCE-THROUGH TWO-TUBE BOILER IN THE DEVELOPMENT OF A CONTROL SYSTEM FOR THE 630A NUCLEAR STEAM GENERATOR,**
by D. Glover and D. P. Flitner. Jan 65, 10p
Contract AT (40-1)-2847
Distribution: No limitation.

Descriptors: (*Power reactors, Steam power plants), (*Steam power plants, Boilers).

**GEMP-353** **Field 18L, 13A**
**CFSTI Prices: HC$1.00 MF$0.50**
General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
**TECHNICAL CONSIDERATIONS LEADING TO THE SELECTION OF THE SERPENTINE-INVOLUTE DESIGN FOR THE 630A BOILER,**
by B. Bonini, D. P. Flitner, and R. G. Cook. 31 Mar 65, 8p
Contract AT (40-1)-2847
Distribution: No limitation.

Descriptors: (*Nuclear power plants, Boilers), (*Boilers, Design).

**N65-16933** **Field 18D**
**CFSTI Prices: HC$3.00 MF$0.50**
Electro-optical systems, Inc., Pasadena, Calif.
**IONIZATION CHAMBER-GEIGER TUBE INSTRUMENT FABRICATION PROGRAM,**
Final rept.,
by M. B. Prince. 28 Mar 64, 57p EOS-5030
NAS7-100, JPL-950658
NASA CR-60706
Distribution: No limitation.

Descriptors: (*Ionization chambers, Production), (*Geiger counters, Production).

**N65-19263** **Field 18I**
**CFSTI Prices: HC$3.00 MF$0.50**
General Electric Co., Pleasanton, Calif. Special Purpose Nuclear Systems Operation.
**RESEARCH PROGRAM FOR THE LONG TERM TESTING OF CYLINDRICAL DIODES AND THE IRRADIATION OF FUEL AND INSULATOR.**
Quarterly summary rept. no. 5,
by S. H. Shepard. 17 Sep 64, 58p GEST-2039
Contract NAS3-2544
NASA CR-54267
Distribution: No limitation.

Descriptors: (*Thermionic converters, Tests), (*Fuels, Thermionic converters).

**N65-34235** **Field 18H**
**CFSTI Prices: HC$4.00 MF$1.00**
United Aircraft Corp., East Hartford, Conn.
**EXPERIMENTAL INVESTIGATION OF THERMAL ANNEALING OF NUCLEAR REACTOR-INDUCED COLORATION IN FUSED SILICA,**
by F. C. Douglas and R. M. Gagosz. Sep 65, 148p
Contract NASw 768
NASA CR 304
Distribution: No limitation.

Descriptors: (*Silicon compounds, Radiation damage), (*Annealing, Silicon compounds).

Patent 3,217,471 Field 18I, 11D
**DIFFUSION BOARD FOR FILTERING HIGH PRESSURE GASES.**
Patent assigned to AEC,
by Leslie Silverman. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Gas filters, Diffusion), (*Containment, Diffusion), Honeycomb cores, Porous materials, Laminates, Aluminum, Stainless steel, Glass textiles, Shock resistance, Patents, Costs, Nuclear power plants.

The diffusion board provides a way of containing a nuclear power plant and prevents release of radioactive particulates. The board consists of a combination or laminated structure involving the use of a porous medium and honeycomb structure. The porous medium is a high efficiency filter paper to trap particulate. The honeycomb is made from a honeycomb material such as aluminum, stainless steel or reinforced fiber glass. The cells of the honeycomb contain proper filtering materials.

PB-168 751 Field 18H, 12A
CFSTI Prices: HC$4.00 MF$0.75
RAND Corp., Santa Monica, Calif.
**GRAPHICAL METHODS FOR THE QUANTITATIVE PREDICTION OF CLOSE-IN FALLOUT,**
by Joseph B. Knox. 31 Jan 58, 117p Research memo. RM-2108
Proj. RAND
AFSWP 1074;
AD 244 894
Distribution: No limitation. Availability: Microfiche only after original copies are exhausted.

Descriptors: (*Radioactive fallout, Mathematical prediction), (*Graphics, Radioactive fallout), Atmosphere models, Boundary value problems.

The quantitative prediction of close-in atomic fallout in middle latitudes is formulated as an initial-value problem. At the time of stabilization of the atomic cloud, certain initial conditions must be known concerning the active debris: (a) the initial distribution of radioactive material with respect to particle size, and (b) the initial distribution of radioactive particle size in space. In addition, the fall velocity of this particulate matter as a function of particle size must be known. To predict the ground positions of this debris, a simple dynamic model of the atmosphere is employed to compute the evolution of the horizontal wind that transports the debris during its fall to the earth's surface through the mobile atmosphere. This dynamical model is designed to include the effect of orography on the evolution of the horizontal wind field; the 'filtering' approximation employed in the dynamical model is a nondiverging wind field computed directly from the initial horizontal wind field. A case study of the prediction of close-in atomic fallout is presented as an illustration of the application of the prediction model and numericalgraphical techniques of integration. (Author)

## 19. ORDNANCE

AD-279 335 Field 19F, 9B
CFSTI Price: HC$1.00
Springfield Armory, Mass. Research and Development Div.
**FEASIBILITY STUDY OF A VARIABLE FIRING RATE FUNCTION GENERATOR FOR ANALOG COMPUTERS,**
by D. Gelfond. 10 Oct 60, 14p SA-TR20-2809
Proj. DA-572-01-004
Distribution: No limitation.

Descriptors: (*Analog computers, Simulation), (*Machine guns, Analysis), Waveform generators, Pulse generators, Feasibility studies, Recoil mechanisms, Firing tests (Ordnance).

A feasibility study is presented of a function generator to simulate the firing pulses of an externally powered machine gun during the analog computer analysis of the recoil motion of the gun. The function generator has a rate that can be varied to simulate the change in firing rate that occurs during the firing acceleration interval of the operational cycle of the weapon. A heterodyne system with a voltage-controlled oscillator was one of the systems studied and found to be impractical. The second system was an electronic time interval generator. This system was found to be the most practical. A variable firing rate function generator can be developed to reproduce with reasonable accuracy the performance of an externally driven weapon during the acceleration period. (Author)

AD-465 987 Field 19A, 21H, 16D
CFSTI Prices: HC$1.00 MF$0.50
Ogden Air Materiel Area, Hill AFB, Utah. Airmunitions Wing (2705th).
**LOW IMPEDANCE HIGH ENERGY ELECTRICAL FUNCTION TEST OF GAS PRESSURE CARTRIDGE PART NUMBER PD60S0129-013 FOR TITAN II MISSILE.**
OOAMA Airmunitions test rept.,
by Don F. Woods. Jun 65, 15p OOY-TR-65-229
Distribution: No limitation.

Descriptors: (*Booster motors, Cartridges), (*Cartridges, Guided missiles), Igniters, Tests, Voltage.

Identifiers: Titan.

The test was conducted to determine the effects of repeated applications of electrical energy from low impedance high energy sources applied between the shorted electrical contract pins and the grounded case of the gas pressure cartridge Part Number PD60S0129-013 used on the Titan Missile. Ten cartridges were tested. Electrical power was supplied from a freshly charged 32 volt 550 ampere hour battery. Electrical power was applied to each cartridge a total of 30 minutes consisting of three applications of 10 minutes duration, with a 15 minute waiting period between power application. No cartridge ignited during the test. The electrical bridge resistance and dielectric strength (pins to case) were measured before and after the application of the electrical energy. No significant changes occurred. The cartridge was destructively tested after completion of the application of the electrical energy. The cartridges performed within the expected current time limits predicted by the Franklin Institute Bruceton Analysis. Application of electrical energy from a low impedance high energy source had no measurable effect on the cartridges. (Author)

N65-35523 Field 19G
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**SUPERSONIC AERODYNAMIC CHARACTERISTICS OF A 1/6-SCALE MODEL OF THE FINAL TWO STAGES OF THE ARGO D-4 FOUR-STAGE ROCKET VEHICLE,**
by Clyde Hayes and William A. Corlett. Oct 65, 22p NASA-TMX-1152
Distribution: No limitation.

Descriptors: (*Rockets, Supersonic characteristics).

Identifiers: Argo rocket.

Patent 3,216,322 Field 19B
**BOMB RACK ADAPTER.**
Patent assigned to Navy,
by Maurice J. Wenger and William H. Hazlett, Jr. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Bomb racks, Adapters), Patents, Bomb carriers, Bomb ejectors, Training, Airborne.

The bomb rack adapter is for carrying and ejecting a bomb or store at high speeds. A streamlined shell is secured to a bomb rack and has a plurality of bays into which are placed removable compartments. These compartments house the practice bomb, the door operating mechanism, the cartridge actuated ejector unit, and the bomb support release band.

Patent 3,216,544 Field 19F
**CLUTCH DEVICE OF SPRAG TYPE.**
Patent assigned to Army,
by Edward J. Ryan. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Clutches, Breech mechanisms), (*Breech mechanisms, Clutches), Patents, Rotation, Torque.

The sprag type clutch is associated with the breechblock of a cannon. The structure is such that one of two rotary members is free to move relative to the other in both directions and the second member is free to move respective to the first member in one direction but, when rotated in the opposite direction, is engaged with the first member for transfer of torque thereto.

Patent 3,217,587 Field 19A
**LOADING FIN STABILIZED ROUNDS.**
Patent assigned to Army,
by Joseph Hegedus, Jr. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Fin-stabilized ammunition, Loading), (*Cartridge cases, Loading), Rotation, Patents.

The apparatus for loading fin-stabilized rounds in a cartridge case includes a fixture for positioning a case and mechanical elements for guiding a projectile into the case and for repetitiously first rotating the projectile through an arc in one direction and then in an opposite direction.

Patent 3,217,601 Field 19F
**GUN FIRING CONTROL DEVICE.**
Patent assigned to Air Force,
by Davis L. Gardner. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Firing mechanisms (Weapon), Hypervelocity guns), Round counters, Switching circuits, Control systems, Patents.

The device controls the number of rounds fired from a high speed Gatlin gun during gun testing. It includes a switch connected to the gun to furnish a pulse each time a round is fired. The pulse is applied to a counting circuit the output of which is applied to a thyratron control circuit through a selector switch. The control circuit then operates a relay connected to the circuit which controls the firing of the gun.

Patent 3,217,650 Field 19A
**OFFSET LINER FOR A CAVITY CHARGE PROJECTILE.**
Patent assigned to Navy,
by Martin A. Paul and Linus C. Pauling. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*High-explosive ammunition, Cavity liners), (*Cavity liners, High-explosive ammunition), (*Projectiles, Spin-stabilized ammunition), Shaped charges, Patents.

The structure of the cavity liner for a spin-stabilized explosive shell improves its penetrating capabilities. The offset liner for the cavity-charge projectile has a plurality of offset plane sectors. The amount of offset increases gradually from the apex to the base portion.

## 20. PHYSICS

**AD-466 487** **Field 20D, 8H**
**CFSTI Prices: HC$1.00 MF$0.50**
Navy Mine Defense Lab., Panama City, Fla.
**WAVE PATTERNS IN DISPERSIVE MEDIA.**
Interim rept.,
by J. Ernest Breeding, Jr. Jul 65, 14p Rept. no. i-84
Proj. SF-011-02-33,
Task 2392-2
Distribution: No limitation.

Descriptors: (*Water waves, Propagation), Scattering, Velocity, Trigonometry, Oscillation.

A comparison is made between wave patterns in dispersive and nondispersive media on the basis of the interference patterns of two sine waves which are of equal amplitude and have very nearly the same frequency. It is shown that for a dispersive medium the number of individual oscillations found between successive group maxima for a wave pattern considered at an instant of time is not the same as that found between successive group maxima for the wave pattern considered at one location. In the limit that the component frequencies approach one and the same value, a comparison of the snapshot with the corresponding sample at a single location shows that there is a factor of one-half for deep water gravity waves, a factor of two-thirds for capillary water waves, and a factory of two for the flexural waves of an elastic rod. (Author)

**AGN-8127** **Field 20M, 11F**
**CFSTI Prices: HC$4.00 MF$1.00**
Aerojet-General Nucleonics, San Ramon, Calif.
**ALKALI METALS EVALUATION PROGRAM. SWIRL FLOW BOILING OF ALKALI METALS HEAT TRANSFER AND PRESSURE DROP,**
by C. R. Fisher, J. H. Moskowitz, and L. T. Clark. Jan 65, 103p
Contract AT (04-3)-368
Distribution: No limitation.

Descriptors: (*Alkali metals, Boiling), (*Heat transfer, Alkali metals).

**AP-NOTE-426** **Field 20H, 18K**
**CFSTI Prices: HC$1.00 MF$0.50**
Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
**NOTES ON PLACZEK'S THEOREM P (O)=RHO AV/RHO INFINITY,**
by R. L. Murray. 20 Jun 62, 20p
Contract AT (30-1)-2639
Distribution: No limitation.

Descriptors: (*Neutron transport theory, Reactor moderators), (*Neutron flux, Neutron absorbers).

**AP-NOTE-440** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
**CALCULATION OF GROUP DIFFUSION COEFFICIENTS,**
by R. L. Murray. 20 Jun 62, 14p
Contract AT (30-1)-2639
Distribution: No limitation.

Descriptors: (*Neutron transport theory, Neutron cross sections).

**BNL-8322** **Field 20K**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**ELASTIC IMAGE CORRECTIONS FOR DOUBLE-FORCE DISPLACEMENT FIELDS,**
by John R. Townsend. 1963, 17p
Contract AT-30-2-GEN-16
Distribution: No limitation.

Descriptors: (*Elasticity, Deformation).

**BNL-8905** **Field 20G**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**A HIGH-FIELD MAGNET FOR THE ALTERNATING- GRADIENT SYNCHROTRON,**
by George Parzen. 1965, 8p CONF-650306-3
Contract AT (30-2)-GEN-16
Prepared for presentation at Particle Accelerator Conference, Washington, D. C. Distribution: No limitation.

Descriptors: (*Synchrotrons, Magnets), (*Magnets, Synchrotrons).

**BNL-8936** **Field 20G**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**RF STRUCTURES FOR LINEAR ACCELERATORS,**
by G. W. Wheeler and S. Giordano. 1964, 17p CONF-650306-6
Contract AT (30-2)-GEN-16
Prepared for presentation at Particle Accelerator Conference, Washington, D. C. Distribution: No limitation.

Descriptors: (*Linear accelerators, Waveguides), (*Waveguides, Linear accelerators).

**BNL-9057** **Field 20G, 9B**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**COMPUTER CALCULATIONS OF MODIFIED AGS MAGNETS.**
Internal rept.,
by P. F. Dahl. 18 Mar 65, 16p
Contract AT-30-2-GEN-16
Distribution: No limitation.

Descriptors: (*Alternating gradient focusing accelerators, Cyclotron magnets), (*Cyclotron magnets, Programming (Computers)).

**BNL-9080** **Field 20G, 9E**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**CONSTANT SPILL SERVO FOR AGS.**
Internal rept.,
by N. J. Halama and R. L. Cassel. 1 Apr 65, 6p
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Alternating gradient focusing accelerators, Servomechanisms), (*Servomechanisms, Alternating gradient focusing accelerators).

**BNL-9090** **Field 20G**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**RF SEPARATION TECHNIQUES AT A SUPER-HIGH- ENERGY ACCELERATOR. PART I.**
Internal rept.,
by J. Sandweiss. 25 Mar 65, 19p
Contract AT (30-2)-GEN-16
Distribution: No limitation.

Descriptors: (*Particle beams, Deflection), (*Particle accelerators, Particle beams).

**BNL-9231** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**ON LINE DATA ANALYSIS OF HIGH ENERGY P-P SCATTERING EXPERIMENT,**
by T. Fujii, E. Anderson and E. Bleser. 11 May 65, 15p CONF-650510-9
Contract AT (30-2)-GEN-16
Prepared for presentation at Purdue Conference on Instrumentation for High Energy Physics, Lafayette, Ind. Distribution: No limitation.

Descriptors: (*Proton scattering, Data processing systems).

Identifiers: On-line systems.

**BNL-9257** **Field 20E**
**CFSTI Price: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**LASER FLASH TUBE TRIGGERING SYSTEM,**
by D. Stephani. 3 Jun 65, 6p
Contract AT-30-2-GEN-16
Distribution: No limitation.

Descriptors: (*Lasers, Flash lamps), (*Flash lamps, Trigger circuits).

**BNL-9297** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**SLOW NEUTRON STUDIES OF MOLECULAR MOTIONS IN CONDENSED MATTER,**
by Harry Palevsky. Jun 65, 37p CONF-650630-2
Contract AT (30-2)-GEN-16
Prepared for presentation at Society of Physical Chemistry, Annual Meeting (15th), Paris. Distribution: No limitation.

Descriptors: (*Thermal neutrons, Molecules), (*Molecules, Motion).

**BNL-9332** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Brookhaven National Lab., Upton, N. Y.
**A NEW SOURCE OF SMALL-ANGLE X-RAY SCATTERING,**
by R. G. Perret and D. T. Keating. 29 Jun 65, 18p CONF-650629-2
Contract AT (30-2)-GEN-16
Presented at Conference on Small-Angle X-ray Scattering, Syracuse, N. Y. Distribution: No limitation.

Descriptors: (*X rays, Scattering).

**C13.46:223** **Field 20N, 20I**
**CFSTI Price: MF$0.50**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**CONCERNING THE THEORY OF RADIATION FROM A SLOTTED CONDUCTING PLANE IN A PLASMA ENVIRONMENT.**
Technical note,
by James R. Wait. 28 Sep 64, 18p NBS-TN-223
N65 14664
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.20.

Descriptors: (*Slot antennas, Antenna radiation patterns), (*Antenna radiation patterns, Plasma medium), (*Plasma medium, Antenna radiation patterns), Wave transmission, Plasma physics.

A preliminary analysis is given for the radiation into a plasma half-space from an infinitely long slot in a perfectly conducting ground plane. The plasma is anisotropic by virtue of a d-c magnetic field which is parallel to the slot. For a homogeneous plasma, it is found that for such a configuration the radiation pattern will be symmetrical but the excited surface wave is highly asymmetrical. The extension of the theory to an inhomogeneous magneto plasma is outlined briefly. (Author)

**C13.46:230** **Field 20N, 4A**
**CFSTI Prices: HC$0.40 MF$0.75**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**VHF IONOSPHERIC SCATTER SYSTEM LOSS MEASUREMENTS EUROPEAN-MEDITERREAN AREA.**
Technical note,
by V. H. Goerke and O. D. Remmler. 25 Dec 64, 63p NBS-TN-230

Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.40.

Descriptors: (*Radio waves, Ionospheric propagation), (*Ionospheric propagation, Radio waves), Very high frequency, Radio transmission, Scattering, Ionosphere, Electron density, Diurnal variations.

The results of VHF ionospheric scatter measurements made in the European-Mediterranean area are shown to be in good agreement with results obtained in continental United States. Sporadic-E propagation was observed much more frequently in the EuropeanMediterranean area than in the United States. The unusual diurnal variations and low signal levels observed by British workers in 1955 on a Gibraltar-UK path are explained on the basis of antenna patterns which favored off-path and high-level scattering by meteoric ionization. It is concluded that the paths and sites used during these tests would be suitable for practical ionospheric forward scatter systems. (Author)

**C13.46:251** **Field 20B**
**CFSTI Price: MF$0.75**
National Bureau of Standards, Washington, D. C.
**RESEARCH ON CRYSTAL GROWTH AND CHARACTERIZATION AT THE NATIONAL BUREAU OF STANDARDS, JANUARY TO JUNE 1964.**
Technical note,
by Howard F. McMurdie. 19 Oct 64, 78p NBS-TN-251
N65 18033
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.45.

Descriptors: (*Crystal growth, State-of-the art studies), Crystallography, Organic compounds, Metals, Inorganic compounds, Refractory materials, Scientific research, United States Government, Bibliographies, Solid state physics.

A wide program of studies involving crystalline materials includes investigation of methods and theory of growth, study of detection and effects of defects, determination of physical properties, refinement of chemical analysis, and determination of stability relations and atomic structure. The types of materials range from organic compounds, through metals, and inorganic salts to refractory oxides. (Author)

**C13.46:300** **Field 20N, 4A**
**CFSTI Prices: HC$0.50 MF$0.75**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**CHARACTERISTICS OF THE EARTH-IONOSPHERE WAVEGUIDE FOR VLF RADIO WAVES,**
by J. R. Wait and K. P. Spies. 30 Dec 64, 98p NBS-TN-300
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.50.

Descriptors: (*Radio waves, Ionospheric propagation), (*Ionospheric propagation, Radio waves), Very low frequency, Radio transmission, Ionosphere, Electron density, Terrestrial magnetism, Geophysics.

The principal results of this technical note are graphical presentations of the attenuation rates, phase velocities, and excitation factors for the dominant modes in the earth-ionosphere waveguide. The frequency range considered is 8 kc/s to 30 kc/s. The model adopted for the ionosphere has an exponential variation for both the electron density and the collision frequency, and the effect of the earth's magnetic field is considered. Comparison with published experimental data confirms that the minimum attenuation of VLF radio waves in daytime is approximtely at 18 kc/s, while at night it is somewhat lower. The directional dependences of propagation predicted by the theory are also confirmed by experimental data. (Author)

**C13.46:302** **Field 20N**
**CFSTI Price: MF$1.00**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**BIBLIOGRAPHY OF FADING ON MICROWAVE LINE OF SIGHT TROPOSPHERIC PROPAGATION PATHS AND ASSOCIATED SUBJECTS.**
Technical note,
by H. T. Dougherty. 31 Aug 64, 117p NBS-TN-302
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.

Descriptors: (*Radio waves, Propagation), (*Microwaves, Attenuation), Wave transmission, Troposphere, Microwave communication systems, Bibliographies.

A collection of titles and abstracts is presented for articles dealing with the microwave fading that has been observed on tropospheric line of sight paths. Selections are included for related subjects such as: measurement of meteorological factors; spatial, frequency and time diversity reception; and attenuation due to trees and buildings. Also included is a subject index and an author index. (Author)

**C13.46:307** **Field 20N**
**CFSTI Prices: HC$0.40 MF$0.75**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**PHASE AND AMPLITUDE DIVERSITY IN OVER-WATER TRANSMISSIONS AT TWO MICROWAVE FREQUENCIES.**
Technical note,
by H. B. Janes, A. W. Kirkpatrick, D. M. Waters, andD. Smith. 12 Apr 65, 67p NBS-TN-307
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.40.

Descriptors: (*Radio waves, Multipath transmission), (*Microwaves, Multipath transmission), Radio transmission, Troposphere, Radio signals, Phase shift, Amplitude modulation, Propagation.

Propagation measurements at 9.4 and 9.2 Gc/s were made over a 47 km, line-of-sight, over-water path at Eleuthera Island in the Bahamas. The purpose was to study the signal amplitude and phase variations at the two frequencies, and in particular, the variations in the phase difference and amplitude ratio ('differential amplitude') of the two frequencies. The results include power spectra of phase and phase difference variations (from about 0.0001 to 4 c/s) and cumulative distributions of amplitude, differential amplitude, and phase difference. (Author)

**C13.46:309** **Field 20M**
**CFSTI Price: MF$1.00**
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
**A BIBLIOGRAPHY OF EXPERIMENTAL SATURATION PROPERTIES OF THE CRYOGENIC FLUIDS,**
Technical note,
by N. A. Olien and L. A. Hall. 9 Apr 65, 119p NBS-TN-309
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.

Descriptors: (*Liquefied gases, Cryogencs), (*Cryogenics, Bibliographies), Phase studies, Helium, Hydrogen, Neon, Nitrogen, Oxygen, Air, Carbon monoxide, Fluorine, Argon, Methane.

A bibliography of 507 references to experimental work is presented for the properties of the cryogenic fluids in the solid, liquid, and vapor phases at saturation. The cryogenic fluids included are helium, hydrogen, neon, nitrogen, oxygen, air, carbon monoxide, fluorine, argon, methane, and isotopes of helium, hydrogen, and methane. Each article was reviewed and coded for properties, method of presentation of the data, and temperature range. An index lists each fluid in five categories: solid-solid transition, solid-liquid transition, solidvapor transition, liquid-vapor transition, and triple point. For helium the liquid-liquid transition is also included. Each category is indexed by the properties: pressure-temperature data, density and heat capacity of all phases at saturation, and latent heats. (Author)

**C13.46-206.5** **Field 20N**
**CFSTI Price: MF$0.50**
Central Radio Propagation Lab., National Bureau of Standards, Boulder, Colo.
**THE NORMAL PHASE VARIATIONS OF THE 16 kc/s SIGNALS FROM GBR OBSERVED AT COLLEGE, ALASKA.**
Technical note,
by J. H. Crary and A. C. Murphy. 30 Sep 65, 39p

NBS TN-206-5
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.30.

Descriptors: (*Radio transmission, Phase shift), Very low frequency, Radio signals, Propagation, Phase distortion, Diurnal variations, Phase measurement, Alaska, Geophysics.

Observations of the normal phase variations of the 16 kc/s signals radiated from Rugby, U.K., and received in College, Alaska, U.S.A., are given in the form of 15-day averages and standard deviations at 5 minute intervals. The relations between the diurnal phase variations and the diurnal variation in the percentage of the path in darkness are shown. The values of the short term phase differences are also given. (Author)

**C13.46-301** **Field 20M**
**CFSTI Price: MF$0.50**
National Bureau of Standards, Boulder, Colo.
**ON THE FORMULATION AND NUMERICAL EVALUATION OF A SET OF TWO-PHASE FLOW EQUATIONS MODELLING THE COOL-DOWN PROCESS.**
Technical note,
by Stephen Jarvis, Jr. 4 Jan 65, 52p NBS-TN-301
Distribution: No limitation. Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.55.

Descriptors: (*Cooling, Two-phase flow), (*Twophase flow, Mathematical models), Numerical analysis, Equations, Pipes.

A model of transient two-phase flow in a pipe is constructed in Eulerian coordinates assuming a single velocity but independent temperatures in the two phases. Experiments on the numerical integration of the system for Cooldown problem by both Lax and Courant-Isaacson-Rees methods indicate that a very fine spatial difference net must be used to compensate for the numerical diffusion essential to computational stability if a second surge is to be realized. (Author)

**C13.46-317** **Field 20M, 7D**
**CFSTI Price: MF$0.75**
National Bureau of Standards, Boulder, Colo. Inst. for Materials Research.
**BOILING HEAT TRANSFER FOR OXYGEN, NITROGEN, HYDROGEN, AND HELIUM.**
Technical note,
by E. G. Brentari, P. J. Giarratano, and R. V. Smith 20 Sep 65, 125p
NBS TN-317
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.

Descriptors: (*Boiling, Liquefied gases), (*Liquefied gases, Heat transfer), (*Heat transfer, Liquefied gases), Cryogenics, Convection (Heat transfer), Nucleate boiling, Film, Helium, Oxygen, Hydrogen, Nitrogen, Thermal conductivity, Viscosity, Surface tension, Density.

The study was conducted to provide an orderly examination of the information relative to boiling

heat transfer for four cryogenic fluids. The general approach has been to examine experimental data with respect to the predictive correlations which would appear to have probable success and which would be likely to be used by design engineers. These correlations were graphically and statistically compared. The results are discussed, and when it appears a best or acceptable recommendation can be made, computation aids for designers are included. These aids are in the form of graphical presentations for preliminary studies and equations for computer studies. The authors have also indicated the apparent limits for the use of these correlations, when possible. The effect of many variables which would often be significant are not included in the predictive correlations. The influence of these variables is discussed in a separate section on boiling variables. (Author)

**C13.46-322** **Field 20M, 7D**
**CFSTI Price: MF$0.50**
National Bureau of Standards, Boulder, Colo. Inst. for Materials Research.
**SURFACE TENSIONS OF NORMAL AND PARA HYDROGEN.**
Technical note,
by R. J. Corruccini. 11 Aug 65, 22p
NBS TN-322
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.20.

Descriptors: (*Hydrogen, Surface tension), (*Surface tension, Liquefied gases).

The published data on the surface tensions of normal hydrogen from three investigations are apparently in disagreement by about 10%. In this note it is shown that these data are actually in agreement within about 1% if properly computed. The resulting concordant data are represented by functions and by a table suitable for linear interpolation. (Author)

**CALT-68-37** **Field 20H, 20C**
**CFSTI Prices: HC$1.00 MF$0.50**
California Inst. of Tech., Pasadena.
**APPLICATIONS OF THE ALGEBRA OF CURRENT COMPONENTS,**
by Roger F. Dashen and Murray Gell-Mann. May 65, 11p
Contract AT (11-1)-68
Distribution: No limitation.

Descriptors: (*Nuclear models, Electric currents), (*Electric currents, Algebra).

**CALT-68-43** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
California Inst. of Tech., Pasadena.
**DISTRIBUTION OF LEPTON PAIRS FROM VECTOR MESON DECAYS,**
by Douglas S. Beder. Jun 65, 26p CALT-68-43
Contract AT (11-1)-68
Distribution: No limitation.

Descriptors: (*Leptons, Pair production), (*Mesons, Decay schemes).

**CONF-650410-2** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Maryland Univ., College Park. Dept. of Physics and Astronomy.
**K (-) P INTERACTIONS AT 940 MeV/c AND THEIR BEARING ON Y (1765).**
Technical rept.,
by G. B. Yodh. May 65, 34p TR-456
Contract AT (40-1)-2504
Presented at American Physical Society, Washington, D. C., 1965. Distribution: No limitation.

Descriptors: (*Meson scattering, Proton scattering), (*K mesons, Proton scattering).

**CONF-650410-3** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Maryland Univ., College Park. Dept. of Physics and Astronomy.
**LOW ENERGY HYPERON-PROTON SCATTERING INTERACTIONS.**
Technical rept. no. 469,
by R. A. Burnstein. Jun 65, 30p
Contract AT (40-1)-2504
Prepared for presentation at American Physical Society, Washington, D. C. Distribution: No limitation.

Descriptors: (*Proton scattering, Hyperons), (*Hyperons, Scattering).

**COO-1195-35** **Field 20H**
**CFSTI Prices: HC$3.00 MF$0.50**
Illinois Univ., Urbana. Dept. of Physics.
**PHOTOPRODUCTION OF POSITIVE PIONS NEAR THRESHOLD IN HYDROGEN, THESIS,**
by James D. Simpson. Jun 64, 55p
Contract AT (11-1)-1195
Distribution: No limitation.

Descriptors: (*Photonuclear reactions, Pions), (*Meson reactions, Hydrogen).

**COO-1198-266** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Illinois Univ., Urbana. Dept. of Physics.
**MOSSBAUER EFFECT AT HIGH PRESSURES,**
by H. Frauenfelder and R. Ingalls. 1964, 24p
Contract AT (11-1)-1198
Distribution: No limitation.

Descriptors: (*Mossbauer effect, High-pressure research), (*High pressure research, Mossbauer effect).

**COO-1371-1** **Field 20H, 12A**
**CFSTI Prices: HC$2.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**COUPLED PARTIAL DIFFERENTIAL EQUATIONS FOR TRINUCLEON 'RADIAL' WAVE FUNCTIONS,**
by M. Bolaterli. 1964, 38p
Contract AT (11-1)-1371
Prepared in cooperation with Minnesota Univ., Minneapolis. School of Physics. Distribution: No limitation.

Descriptors: (*Nuclear energy levels, Wave functions), (*Wave functions, Differential equations).

**COO-1428-12** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Purdue Univ., Lafayette, Inc.
**STRANGE PARTICLE PRODUCTION IN 2.7 GeV/c PI (-)P INTERACTIONS,**
by D. H. Miller, A. Z. Kovacs, R. L. McIlwain, T. R. Palfrey, and G. W. Tautfest. 1965, 22p
Contract AT (11-1)-1428
Distribution: No limitation.

Descriptors: (*Strange particles, Meson reactions), (*Pions, Proton scattering).

**COO-921-16** **Field 20G**
**CFSTI Prices: HC$1.00 MF$0.50**
Michigan Univ., Ann Arbor. Coll. of Literature, Science, and the Arts.
**THE UNIVERSITY OF MICHIGAN 83-INCH CYCLOTRON.**
Final rept.,
by W. C. Parkinson and R. S. Tickle. May 65, 21p
Contract AT (11-1)-921
Distribution: No limitation.

Descriptors: (*Cyclotrons, Nuclear spectroscopy), (*Nuclear spectroscopy, Cyclotrons).

**CU-1932-239** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Nevis Labs., Columbia Univ., Irvington-on-Hudson, N. Y.
**ANTIPROTON ANNIHILATION IN HYDROGEN AT REST. PART I. REACTION P AND P YIELDS K AND K AND PI,**
by N. Barash, P. Franzini, L. Kirsch, D. Miller, and T. H. Tan. May 65, 30p CU-239, NEVIS-133, R-501
Contract AT (30-1)-1932, NSF-GP-1250
Distribution: No limitation.

Descriptors: (*Antiprotons, Annihilation reactions), (*Annihilation reactions, Hydrogen).

**GA-5968** **Field 20H, 9B**
**CFSTI Prices: HC$2.00 MF$0.75**
General Atomic, San Diego, Calif. John Jay Hopkins Lab. for Pure and Applied Science.
**MUSE -- A COMPUTER CODE FOR MULTIPLE SCATTERING CORRECTIONS,**
by H. C. Honeck. 1 Oct 64, 69p
Contract AT (04-3)-167
Distribution: No limitation.

Descriptors: (*Neutron transport theory, Programming (Computers)), (*Programming (Computers), Neutron cross sections).

**N65-15403** **Field 20M, 1A**
**CFSTI Prices: HC$3.00 MF$0.50**
Alabama U., Huntsville. Research Inst.
**EFFECT OF GAS-SURFACE INTERACTION POTENTIAL ON ENERGY AND MOMENTUM TRANSFER IN HIGH KNUDSEN NUMBER GAS FLOW, PARTICULARLY FOR CONDENSABLE GAS MEDIA,**
by A. B. Huang. Sep 64, 59p UARI-RR-10
GRANT NsG-381
NASA CR-60347
Distribution: No limitation.

Descriptors: (*Gas flow, Transport properties), (*Transport properties, Gas flow).

**N65-15425** **Field 20M**
**CFSTI Prices: HC$2.00 MF$0.50**
General Dynamics/Astronautics, San Diego, Calif.
**TOTAL EMISSIVITY OF HOT WATER VAPOR. I. THE HIGH-PRESSURE UPPER LIMIT,**
by F. P. Boynton, C. C. Ferriso, and C. B. Ludwig. Sep 64, 35p GDA-DBE-64-055
Contract NAS8-11363
NASA CR-60353
Distribution: No limitation.

Descriptors: (*Water vapor, Thermal radiation).

**N65-16476** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Stanford Research Inst., Menlo Park, Calif.
**COLLISION LIFETIMES, PHASE SHIFTS AND ORBITING PHENOMENA,**
by Felix T. Smith. 1 Nov 63, 28p
Contract NASr49'07
NASA CR-55132
Distribution: No limitation.

Descriptors: (*Nuclear particles, Nuclear properties).

**N65-16838** **Field 20F, 11C**
**CFSTI Prices: HC$1.00 MF$0.50**
IIT Research Inst., Chicago, Ill.
**INVESTIGATION OF LIGHT SCATTERING IN HIGHLY REFLECTING PIGMENTED COATINGS,**
Monthly progress rept. no. 4, 1 Oct-1 Nov 63,
by G. A. Zerlaut. 1963, 11p IITRI-C6018-4
Contract NASR-65 (07)
NASA CR-55196

Distribution: No limitation.

Descriptors: (*Coatings, Light), (*Light, Scattering).

N65-16978 Field 20F, 11C
CFSTI Prices: HC$1.00 MF$0.50
IIT Research Inst., Chicago, Ill.
**INVESTIGATION OF LIGHT SCATTERING IN HIGHLY REFLECTING PIGMENTED COATINGS.**
Monthly progress rept. no. 5, 1 Nov-1 Dec 63,
by G. A. Zerlaut. 1963, 11p IITRI-C6018-5
Contract NASR-65 (07)
NASA CR-55282
Distribution: No limitation.

Descriptors: (*Coatings, Light), (*Light, Scattering).

N65-16987 Field 20L
CFSTI Prices: HC$1.00 MF$0.50
Chicago Univ., Ill. Dept. of Physics.
**THE INFLUENCE OF IMPURITIES ON THE INTERACTIONS RESPONSIBLE FOR SUPERCONDUCTIVITY,**
by M. H. Cohen. 1963, 13p
Grant NSG-352
NASA CR-55552
Distribution: No limitation.

Descriptors: (*Carriers (Semiconductors), Superconductivity), (*Superconductivity, Carriers (Semiconductors)).

N65-17254 Field 20N
CFSTI Prices: HC$1.00 MF$0.50
Alabama Univ., Huntsville. Research Center.
**ON THE WAVE PROPAGATION IN NONUNIFORM MEDIA,**
Hung Yuet Yee and Frederick J. Tischer. 1964, 4p
Grant NsG608,
NASA CR-60765
Prepared in cooperation with North Carolina State Coll., Raleigh. Dept. of Electrical Engineering.
Distribution: No limitation.

Descriptors: (*Electromagnetic waves, Propagation).

N65-17258 Field 20H
CFSTI Prices: HC$1.00 MF$0.50
John Jay Hopkins Lab. for Pure and applied Science, General Atomic, San Diego, Calif.
**NEUTRON CROSS SECTIONS FOR U (238).**
Topical rept.,
by G. D. Joanou and C. A. Stevens. 22 Jan 65, 22p Rept. no. GA-6087
Contract SNPC-27
NASA CR-54290
Distribution: No limitation.

Descriptors: (*Uranium, Neutron cross sections), (*Neutron cross sections, Uranium).

N65-17275 Field 20M
CFSTI Prices: HC$2.00 MF$0.50
Naval Research Lab., Washington, D. C.
**RADIATION LOSSES FROM HIGH-TEMPERATURE GAS DISCHARGES,**
by Alan C. Kolb. 1963, 26p
NASA CR-50352
Distribution: No limitation. Presented at the Symposium on Quantitative Spectroscopy and Applications in Space Science, California Inst. of Tech., Pasadena. 20-22 Mar 63.

Descriptors: (*Gas discharges, Thermal radiation), (*Heat transfer, Gas discharges).

N65-17403 Field 20K
CFSTI Prices: HC$2.00 MF$0.50
Southwest Research Inst., San Antonio, Tex.
**THEORETICAL AND EXPERIMENTAL INVESTIGATIONS OF THE NONLINEAR DYNAMIC RESPONSE OF CONTINUOUS SYSTEMS.**
Final rept.,
by Thein Wah. 31 Jan 65, 49p
Contract NASr94 05,
Proj. SwR103 1435
NASA CR-60802
Distribution: No limitation.

Descriptors: (*Beams (Structural), Vibration).

N65-17749 Field 20H
CFSTI Prices: HC$3.00 MF$0.50
Colorado State Univ., Fort Collins.
**SECONDARY EMISSION EFFECTS IN ION BEAMS.**
Master's thesis,
by C. A. Marazzi. Nov 64, 57p
NASA CR-57119
Distribution: No limitation.

Descriptors: (*Ion beams, Secondary emission), (*Secondary emission, Ion beams).

N65-19691 Field 20N
CFSTI Prices: HC$1.00 MF$0.50
Alabama Univ., Huntsville Research Inst.
**WAVE PROPAGATION IN GROOVE GUIDES,**
by H. Y. Yee and N. F. Audeh. 1964, 24p
Grant NsG-381
NASA CR-57272
Distribution: No limitation.

Descriptors: (*Electromagnetic waves, Waveguides).

N65-19888 Field 20I, 1A
CFSTI Prices: HC$5.00 MF$1.00
Case Inst. of Tech., Cleveland, Ohio.
**TRANSPORT PROPERTIES OF A TURBULENT LORENTZ GAS.**
Doctoral thesis,
by Eugene N. Frank. Jan 65, 171p TR-A-33
NASA CR-57433
Microfilmed from best available copy. Distribution: No limitation.

Descriptors: (*Gases, Transport properties), (*Plasma medium, Turbulence).

N65-20423 Field 20K, 13M
CFSTI Prices: HC$3.00 MF$0.75
Narmco Research and Development Div., Whittaker Corp., San Diego, Calif.
**DESIGN AND FABRICATION AND DELIVERY OF FIBERGLASS BOX BEAM ASSEMBLY.**
Final rept.,
by William H. Gottwald. Mar 65, 92p
Contract NAS8 11749
NASA CR-57596
Distribution: No limitation.

Descriptors: (*Beams (Structural), Glass textiles), (*Glass textiles, Beams (Structural)).

N65-20792 Field 20F
CFSTI Prices: HC$1.00 MF$0.50
Santa Barbara Research Center, Goleta, Calif.
**35-ELEMENT COLD GAS-COOLED ARRAY,**
by J. J. Long. 10 Mar 65, 19p
Contract NAS7 100
NASA CR-57757
Distribution: No limitation.

Descriptors: (*Spectrum analyzers, Design).

N65-20982 Field 20M
CFSTI Prices: HC$2.00 MF$0.50
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
**AN EQUATION OF STATE OF GASES AT HIGH TEMPERATURES AND DENSITIES,**
by J. S. Rowlinson. 15 Aug 63, 28p WIS-TCI-32
Grant NsG-275-62 (4180)
NASA CR-51654
Distribution: No limitation.

Descriptors: (*Gases, Equations of state), (*Equations of state, Gases).

N65-21325 Field 20I
CFSTI Prices: HC$3.00 MF$0.50
Rensselaer Polytechnic Inst., Troy, N. Y.
**PLASMA DIFFUSION AS AN INITIAL VALUE PROBLEM,**
by D. A. Huchital and E. H. Holt. Dec 64, 56p Rept. no. TR-15
Grant NsG48 60
NASA CR-57955
Distribution: No limitation.

Descriptors: (*Plasma physics, Diffusion), (*Diffusion, Plasma physics).

N65-21467 Field 20H
CFSTI Prices: HC$3.00 MF$0.75
Oak Ridge National Lab., Tenn.
**SPECTRA OF GAMMA RAYS PRODUCED BY THE INTERACTION OF 160-MeV PROTONS WITH Be, O, Al, Co, AND Bi,**
by W. Zobel, F. C. Maienschein, and R. J. Scroggs. Apr 65, 76p ORNL-3506
Contract W7405eng26, NASA Order R104
NASA CR-62177
Distribution: No limitation.

Descriptors: (*Gamma-ray spectra, Proton reactions), (*Proton reactions, Gamma-ray spectra).

N65-21767 Field 20L
CFSTI Prices: HC$1.00 MF$0.50
RCA Labs. Div., Radio Corp. of America, Princeton, N. J.
**INTERACTION OF ELECTRONIC CURRENT WITH HYPERSONIC WAVES IN SOLIDS.**
Quarterly progress rept. no. 3, Apr 1-Jun 31 64,
by R. W. Smith and R. F. Mayo. 10 Jul 64, 23p
Contract NAS8-11120
NASA CR-62254
Distribution: No limitation.

Descriptors: (*Electric currents, Crystals), (*Semiconductors, Acoustic properties).

N65-21773 Field 20A
CFSTI Prices: HC$2.00 MF$0.50
Wyle Labs., Huntsville, Ala.
**THE SOUND FIELD FOR SINGULARITIES IN MOTION,**
by M. V. Lawson. 7 Dec 64, 39p Rept. no. WR-64-10
Contracts NAS8 11308, NAS8 5384
NASA CR-62226
Distribution: No limitation.

Descriptors: (*Sound, Analysis), (*Force (Mechanics), Motion).

N65-22128 Field 20B
CFSTI Prices: HC$1.00 MF$0.50
John Jay Hopkins Lab. for Pure and Applied Science, General Atomic, San Diego, Calif.
**GRAIN GROWTH CHARACTERISTICS OF VAPORDEPOSITED TUNGSTEN AT TEMPERATURES UP TO 2500C,**
by A. F. Weinberg, J. R. Lindgren, N. B. Elsner, and R. G. Mills. 26 Mar 65, 24p Rept. no. GA-6231
Contract NAS3 4165
NASA CR-62305
Distribution: No limitation.

Descriptors: (*Tungsten, Crystal growth).

N65-22164 Field 20J, 12A
CFSTI Prices: HC$2.00 MF$0.50
Theoretical Chemistry Inst., Wisconsin Univ., Madison.
**PERTURBED OPERATORS IN HILBERT SPACE,**
by Theodore W. Palmer. 25 Sep 64, 46p
Grant NsG275 62
NASA CR-62356
Distribution: No limitation.

Descriptors: (*Operators (Mathematics), Perturbation theory), (*Quantum mechanics, Chemistry).

N65-22174 Field 20F
CFSTI Prices: HC$5.00 MF$1.25
Perkin-Elmer Corp., Norwalk, Conn. Electro-Optical Div.
**DETERMINATION OF OPTICAL TECHNOLOGY EXPERIMENTS FOR A SATELLITE.**
Phase 2 rept.,
by Herbert F. Wischnia. Feb 65, 197p Engineering rept. no. ER-7924
Contract NAS8 11408
NASA CR-62340
Distribution: No limitation.

Descriptors: (*Optical equipment, Satellites (Artificial)), (*Satellites (Artificial), Optical equipment).

N65-22178 Field 20J
CFSTI Prices: HC$1.00 MF$0.50
Texas Univ., Austin. Dept. of Physics.
**SOME FIRST-ORDER PERTURBATION ENERGY VALUES,**
by Frank Sanders and Charles W. Scherr. 1964, 5p
Grant NsG263 62
NASA CR-56809
Distribution: No limitation.

Descriptors: (*Perturbation theory, Energy), (*Energy, Perturbation theory).

N65-24564 Field 20M
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**BIBLIOGRAPHY ON THERMAL METALLIC CONTACT CONDUCTANCE,**
by Harry Atkins. 15 Apr 65, 26p NASA-TMX-53227
Distribution: No limitation.

Descriptors: (*Bibliographies, Heat transfer), (*Heat transfer, Metals).

N65-24999 Field 20M
CFSTI Prices: HC$1.00 MF$0.60
National Bureau of Standards, Boulder, Colo.
**A BIBLIOGRAPHY OF EXPERIMENTAL SATURATION PROPERTIES OF THE CRYOGENIC FLUIDS.**
Technical note,
by N. A. Olien and L. A. Hall. 23 Jul 65, 121p
Rept. no. TN-309
NASA CR-62880
Distribution: No limitation.

Descriptors: (*Cryogenics, Fluids).

N65-27618 Field 20F
CFSTI Prices: HC$3.00 MF$0.75
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**DIGITAL COMPUTER SIMULATION OF THE INFRARED INTERFEROMETER SPECTROMETER (IRIS) AND INTERFEROGRAM ANALYSIS,**
by L. H. Byrne. Jan 65, 72p NASA-TM-X-55219; X-650-65-24
Distribution: No limitation.

Descriptors: (*Spectrum analyzers, Simulation).

N65-27640 Field 20F, 4B
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**THE INFRARED INTERFEROMETER SPECTROMETER EXPERIMENT (IRIS). VOLUME II: METEOROLOGICAL MISSION,**
by R. A. Hanel and L. Chaney. Feb 65, 46p
NASA-TM-X-55218; X-650-65-75
Distribution: No limitation.

Descriptors: (*Spectrum analyzers, Infrared equipment), (*Meteorological parameters, Measurement).

N65-28099 Field 20C, 12A
CFSTI Prices: HC$2.00 MF$0.50
Illinois Univ., Urbana. Dept. of Electrical Engineering.
**PRINCIPLE OF SCALING IN A UNIAXIAL MEDIUM.**
Scientific rept. no. 6,
by C. P. Bates and R. Mittra. Jun 65, 30p Rept no. AL-65-12
Grant NSG395
NASA CR-63783
Distribution: No limitation.

Descriptors: (*Magnetic fields, Field theory), (*Field theory, Fourier analysis).

N65-31141 Field 20H, 20J
CFSTI Prices: HC$1.00 MF$0.50
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
**VIBRATIONAL ENERGY TRANSFER IN HIGH ENERGY COLLISIONS,**
by Charles E. Treanor. Aug 65, 22p
Contract NASr119
NASA CR-291
Distribution: No limitation.

Descriptors: (*Electron transitions, Probability), (*Potential theory, Molecules).

N65-31570 Field 20K
CFSTI Prices: HC$5.00 MF$1.00
Aerospace Research Associates, West Covina, Calif.
**CONCEPTS OF MULTIPLE-IMPACT STUDY OF ENERGY ABSORPTION.**
Aug 65, 145p
Contract NAS7 226
NASA CR-273
Distribution: No limitation.

Descriptors: (*Impact shock, Absorption), (*Energy, Absorption).

N65-32397 Field 20H
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**INFLUENCE OF OPPOSING SLITS ON MOLECULAR FLOW FROM AN ISOTHERMAL ENCLOSURE AT LOW DENSITIES,**
by Eugene J. Manista and John W. Sheldon. Sep 65, 21p
NASA TND-2986
Distribution: No limitation.

Descriptors: (*Molecular beams, Density), (*Kinetic theory, Molecular beams).

N65-32645 Field 20B
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**INFLUENCE OF CRYSTAL ORIENTATION ON FRICTION CHARACTERISTICS OF TITANIUM SINGLE CRYSTALS IN VACUUM,**
by Donald H. Buckley. Sep 65, 12p
NASA TND-2988
Distribution: No limitation.

Descriptors: (*Titanium, Single crystals), (*Friction, Crystal structure).

N65-32963 Field 20D
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**A VISUAL STUDY OF TWO-PHASE FLOW IN A VERTICAL TUBE WITH HEAT ADDITION,**
by Yih Yun Hsu and Robert W. Graham. Jan 63, 24p NASA-TND-1564
Distribution: No limitation.

Descriptors: (*Two-phase flow, Flow visualization), (*Flow visualization, Two-phase flow).

N65-33545 Field 20C, 12A
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**BETHE-PEIERLS-WEISS APPROXIMATION AND A MODEL FOR FERROMAGNETIC THIN FILMS,**
by Gale Fair. Sep 65, 35p
NASA TND-2979
Distribution: No limitation.

Descriptors: (*Ferromagnetic materials, Mathematical models), (*Statistical analysis, Ferromagnetism).

Identifiers: Bethe-Peierls-Weiss approximation.

N65-33546 Field 20I
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ENERGY ADDITION TO AN ATOMIC HYDROGEN PLASMA AT OFF-RESONANT CONDITIONS,**
by Richard R. Woollett. Sep 65, 45p
NASA TND-2982
Distribution: No limitation.

Descriptors: (*Plasma medium, Hydrogen), (*Resonance, Plasma oscillations).

N65-33547 Field 20G
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ACCELERATION OF A CONDUCTING FLUID BY A TRAVELING MAGNETIC FIELD,**
by Willis H. Braun. Sep 65, 32p
NASA TND-3006
Distribution: No limitation.

Descriptors: (*Traveling wave electron accelerators, Magnetic fields), (*Fluids, Acceleration).

N65-33841 Field 20L
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Moffett Field, Calif. Ames Research Center.
**COMPARISON OF METHODS IN CALCULATING FREQUENCIES OF CORNER-SUPPORTED RECTANGULAR PLATES,**
by Robert E. Reed, Jr. Sep 65, 36p
NASA TN-D-3030
Distribution: No limitation.

Descriptors: (*Rectangular bodies, Dynamics), (*Flat plate models, Dynamics).

N65-34435 Field 20K
CFSTI Prices: HC$2.00 MF$0.50
McDonnell Aircraft Corp., St. Louis, Mo.
**RANDOM PRESSURE EXCITATION OF SHELLS AND STATISTICAL DEPENDENCE EFFECT OF NORMAL MODE RESPONSE,**
by Robert E. Davis. Sep 65, 32p
Contract NAS1-3179
NASA CR-311
Distribution: No limitation.

Descriptors: (*Structural shells, Mechanical properties).

N65-34503 Field 20F
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration. Huntsville, Ala. Marshall Space Flight Center.
**PRELIMINARY CONSIDERATIONS OF OPTICAL TELESCOPES FOR LUNAR SURFACE USE,**
by Ernest H. Wells. Oct 65, 33p
NASA TND-3003
Distribution: No limitation.

Descriptors: (*Telescopes, Moon), (*Moon, Surface properties).

N65-35059 Field 20H, 4A
CFSTI Prices: HC$3.00 MF$0.75
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**MODULATION AND SAMPLING OF HYDROMAGNETIC RADIATION,**
by Charles P. Sonett. Oct 65, 78p NASA-TND-2950
Distribution: No limitation.

Descriptors: (*Magnetohydrodynamics, Probes), (*Probes, Magnetohydrodynamics).

N65-35395 Field 20I
CFSTI Prices: HC$1.00 MF$0.50
Goddard Space Flight Center, Greenbelt, Md.
**TWO-STREAM INSTABILITY IN GRAVITATING PLASMAS WITH MAGNETIC FIELD AND ROTATION,**
by S. P. Talwar. Oct 65, 19p NASA-TND-3025
Distribution: No limitation.

Descriptors: (*Plasma oscillations, Stability).

Patent 3,216,308 Field 20F, 1B
**AIRCRAFT LANDING SIGHT INCLUDING COLLIMATING MANGIN MIRROR AND CORRECTOR LENS.**
Patent assigned to Navy,
by Marvin J. Northcutt. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Landing aids, Aircraft landings), (*Optical sights, Landing aids), Patents.

The optical sight unit aids the landing of an aircraft particularly when the landing area is short, such as on an aircraft carrier. The sight unit produces a single reference line focussed at infinity by incorporating a solid lens system employing a folded light path which passes through a beam splitter and unique Mangin mirror correction system to properly collimate the projected image.

Patent 3,217,099 Field 20F
**SEQUENTIAL LIGHT AMPLIFIER SYSTEM.**
Patent assigned to Air Force,
by Radames K. H. Gebel. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Amplifiers, Light), (*Light, Amplifiers), Optical equipment, Patents.

The light amplification system is for use in military and scientific fields to observe objects or to photograph objects at light levels for which the human or present photographic systems with short exposures are not sufficiently sensitive. The system includes an input optical system, an image converter, an image transducer, video circuits and a reproducer.

Patent 3,217,591 Field 20I, 20F
**ANGLED PLATE SCANNING INTERFEROMETER.**
Patent assigned to AEC,
by William L. Barr and Andrew L. Gardner. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Interferometers, Plasma medium), (*Plasma medium, Temperature), Line spectrum, Light.

The interferometer is for the continuous recording of plasma temperatures as related to spectral line broadening. The interferometer embodies a beam displacer in conjunction with a pair of slightly angled interferometer plates whereby a resultant interference pattern is produced when a beam of selected light is passed therethrough. The order of the interferometer pattern for a given wavelength changes as a result of gradually changing the interferometer plate spacing. Due to the angle of the plates, the interference pattern changes as the light beam is displaced perpendicular to the normal of the plane of the interferometer plates.

Patent 3,217,596 Field 20F
**INFRARED REFRACTING LENS SYSTEM.**
Patent assigned to Navy,
by Allen E. Murray and Maximillian J. Herzberger. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lenses, Infrared radiation), (*Infrared radiation, Refraction), Patents, Images, Silicon, Sapphires, Geometric forms, Infrared optical systems.

The refracting lens system has a relatively large image field and is capable of forming a real image of an infinitely distant object. The system includes a convergent meniscus lens and an aplanatic meniscus lens, each composed of silicon to form a silicon doublet, and a plano-convex lens composed of sapphire.

Patent 3,218,235 Field 20I
**METHOD AND APPARATUS FOR PRODUCING A MAGNETICALLY CONFINED HOT DENSE PLASMA.**
Patent assigned to AEC,
by Arthur W. Ehler. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Plasma generators, Patents), Hightemperature research, Density, Helium, Vacuum apparatus, Particle accelerators, Electrons, Ions.

The confined high-temperature gases or plasma are of utility in aerospace propulsion, controlled thermonuclear reactions, and magnetohydrodynamics. High energy or relativistic electrons emitted by He6 or other radioisotope gas is introduced into a magnetic confinement field to dissociate and/or ionize atomic, molecular and/or molecular ion particles to produce a continued quantity of electrons and ions trapped in a low intensity level of the magnetic field and thereafter to replace and/or substitute other ions and gases in the field and then to compress the trapped quantity of particles by intensification of the magnetic field simultaneously with or shortly before injecting high energy particles into the plasma.

PB-168 563 Field 20H
CFSTI Prices: HC$3.00 MF$0.75
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**ETUDE ET REALISATION D'UN SPECTROMETREBETA A CHAMP MAGNETIQUE AXIAL UNIFORME, MUNI D'UN SELECTEUR DE COINCIDENCE BETAGAMMA. ETUDE DES SPECTRES BETA DU 32P, 203Hg, 198Au. MESURE DES COEFFICIENTS DE CONVERSION DU 203Tl ET DU 198Hg (Study and Construction of a beta-Spectrometer of Uniform Axial Magnetic Field Fitted with a beta-gamma Coincidence Selector. Study of the beta Spectra of 32P, 203Hg, 198Au. Measurement of the Conversion coefficients of 203Tl and of 198Hg).**
Doctoral thesis in French,
by Daniel Parsignault. 1965, 71p CEA-R-2631
Text in French; Attached Summary in English.
Distribution: No limitation.

Descriptors: (*Beta-ray spectroscopy, Spectrum analyzers), (*Conversion ratio, Beta decay), Beta spectrum, Phosphorus, Mercury, Gold, Thallium, Gamma emission, Coincidence counting, France.

The principle is given of the beta spectrometer with uniform axial field using systematically the idea of caustics. The apparatus is described and its properties compared to those deduced from trajectory calculations. The beta-ray and gamma-ray detectors and the device for selecting coincidences with a 2 tau resolution of 5 nanoseconds are presented. The spectrometer is used for studying reference elements and the most accurate results are confirmed. The beta spectrum of (60)Co has a statistical form with an accuracy of 1 per cent; the maximum energy E is 316.5 ± 1.5 keV. That of the 7/2 (+) to 11/2 transition for (137)Cs has a unique form, once forbidden. The shape of the P32 beta spectrum is determined. The conversion coefficients of the 203Hg beta spectrum are determined.

PB-168 634 Field 20N
CFSTI Prices: HC$4.00 MF$0.75
**SOVIET RESEARCH ON RADIO FREQUENCY DIFFRACTION THEORY.**
Nov 65, 101p PAL-65-3
Distribution: No limitation.

Descriptors: (*Electromagnetic waves, Diffraction), (*Diffraction, Theory), USSR, Solids, Surfaces, Wedges, Discs, Rings, Conical bodies, Parabolic bodies, Radiofrequency, Reviews, Diffraction gratings, Numerical analysis, Wave functions, Asymptotic series.

The Soviet research discussed in this report has been mainly restricted to RF diffraction by solid obstacles with fixed shapes, the obstacles defined in a completely general way to include apertures and screens with latticetype structures. However, some diffraction phenomena over the surface of the sea have also been included. This report is based on a recent survey of the Soviet literature by specialists in radio physics.

PB-168 710 Field 20M, 20D
CFSTI Price: HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
**ON THE MECHANISM OF SUBCOOLED NUCLEATE BOILING,**
by S. G. Bankoff. 5 Feb 59, 54p Memo-30-8
Contract NASw-6
Distribution: No limitation.

Descriptor: (*Nucleate boiling, Heat transfer), (*Heat transfer, Convection (Heat transfer)), Two-phase flow, Bubbles, Quenching (Cooling), Liquids, Turbulence.

The mechanism of heat transfer in forced-convection subcooled nucleate boiling is considered. A three-step model is proposed. First, the heat flows from the wall into the adjacent liquid by two parallel paths: (a) the portion of the wall area which is periodically covered by bubbles is primarily cooled by quenching, due to colder liquid rushing in as the bubbles collapse; (b) over the remainder of the wall area, convective heat transfer is induced primarily by the stirring effect of the bubbles. Secondly, heat flows through the two-phase

wall layer, partly by turbulent convection in the liquid between the bubbles, and partly by latent heat transport within the bubbles themselves. Finally, the heat flows by turbulent convection from the edge of the two-phase wall layer into the turbulent core. Expressions are deduced for the quenching heat flux and the mean velocity induced by the bubbles.

**PB-168 737** **Field 20K, 9B**
**CFSTI Prices: HC$5.00 MF$1.00**
Bureau of Public Roads, Washington, D. C.
**ELECTRONIC COMPUTER FOR SIMPLE BEAM ANALYSIS,**
by Charles J. Gaylord. Jun 65, 188p BPR Program-ST-10
Distribution: No limitation.

Descriptors: (*Beams (Structural), Mechanical analysis), Shear stresses, Bending, Stresses, Loading (Mechanics), Deflection, Moments, Computers, Analysis.

The program is used for the computation of the shear force, bending moment, required section modulus, deflection and stress due to uniform or concentrated loads at any number of points of a determinate beam. The program provides answers for five typical beam conditions with uniform or variable moment of inertia: (1) Statically determinate beam with no overhangs, (2) Overhang on left end, (3) Overhang on right end, (4) Overhangs on both ends, (5) Cantilever beam. In the case of truck loading the truck is placed so as to produce maximum positive and negative moments, and also deflections for these positions. The deflection of continuous beams can be determined due to applied loading and previously determined reactions. (Author)

**PB-168 767** **Field 20H**
**CFSTI Prices: HC$3.00 MF$0.50**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**CONTRIBUTION A LA MESURE ABSOLUE DE L'ACTIVITE DES ISOTOPES SE DESINTEGRANT PAR CAPTURE ELECTRONIQUE. DETERMINATION DU RENDEMENT DE FLUORESCENCE DE QUELQUES ELEMENTS (CONTRIBUTION TO THE MEASUREMENT OF ABSOLUTE ACTIVITY OF ELECTRON CAPTURE NUCLIDES. DETERMINATION OF THE FLUORESCENCE YIELD OF SOME ELEMENTS,**
by Jean Legrand. Sep 65, 56p CEA-R-2813
Distribution: No limitation. Text in French; Attached Summary in English.

Descriptors: (*Electron capture, Fluorescence), (*Decay schemes, X rays), Gamma emission, Probability, Corrections, Excitation, Chromium, Manganese, Zinc, France.

Two techniques were studied of measurement of the absolute activity of electron capture nuclides. The number of X rays emitted from the K shell due to the reorganisation of atomic electrons following electron capture was determined. This measurement was made with a high presure (5 kg/sq-cm) 4 pi proportional counter. The absorption in the source and the backing were studied. To determine the absolute activity it is necessary to know the fluorescence yield and the different capture probabilities. When the electron capture is followed by gamma emission (within the resolution time of the coincidence circuit) the activity was determined the X-gamma coincidence method. In such a case it is not necessary to know the fluorescence yield and the capture probabilities. Various corrections - dead time, chance coincidences - were studied. This method minimizes the decay scheme corrections. (Author)

**PB-168 768** **Field 20B**
**CFSTI Prices: HC$1.00 MF$0.50**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**DIFFUSION LE LONG ET AUTOUR DES DISLOCATIONS (DIFFUSION ALONG AND AROUND DISLOCATIONS),**
by Gilbert Brebec. Oct 65, 20p CEA-R-2831
Text in French; Attached Summary in English.
Distribution: No limitation.

Descriptors: (*Diffusion, Partial differential equations), (*Crystal lattice defects, Diffusion), Symmetry (Crystallography), Mathematical analysis.

Some solutions for Fick's equations applicable to diffusion in dislocations are presented. The problems is fairly similar to that of grain boundaries but in this case a further difficulty arises, purely mathematical in fact, due to the supposedly cylindrical shape of the perturbed region round a dislocation. Presented is the form of Fick's equation used in order to express simply the limiting conditions and so that the solution takes into account the symmetry of revolution of the system. This very much complicates the final form of the results. A solution obtained using the same hypotheses and making the same approximations as those employed by WHIPPLE for his grain boundary work as an illustration. An exact solution is given for a platelet of finite thickness assuming that the diffusion in the defectless crystal is negligible and that the surface diffusion is infinitely fast.

**PB-168 769** **Field 20M, 14B**
**CFSTI Prices: HC$3.00 MF$0.75**
Commissariat a l'Energie Atomique, Fontenay-AuxRoses (France). Centre d'Etudes Nucleaires.
**REALISATION D'UNE INSTALLATION D'ANALYSE THERMIQUE DIFFERENTIELLE RAPIDE (CONSTRUCTION OF A FAST DIFFERENTIAL THERMAL ANALYSIS APPARATUS),**
by Goulven Vernois. Oct 64, 89p CEA-R-2447
Distribution: No limitation. Text in French; Attached Summary in English.

Descriptors: (*Thermal analysis, Instrumentation), Controlled atmospheres, France.

The various possibilities are analyzed of DTA as well as conventional installation set-ups. It is shown that by varying simultaneously the heating rate and the size of the samples it is possible to obtain very similar thermo-grams. The advantages are shown of using fast heating rates and a type of oven and types of crucible are proposed which allow heating rates of over 1 degree per second, rapid manipulation, a controlled atmosphere (from a vacuum up to high pressures) and forced cooling. Details are given of research carried with this type of installation showing the quantitative nature of the analyses and, as an example, studies the influence of a grinding on the qualitative and quantitative results. (Author)

**PB-168 770** **Field 20C, 20I**
**CFSTI Prices: HC$3.00 MF$0.75**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**CONTRIBUTION A L'ETUDE DES INSTABILITIES A HAUTE FREQUENCE DANS LA DECHARGE REFLEX A CATHODES FROIDES (STUDY OF HIGH FREQUENCY INSTABILITIES ON A COLD CATHODE REFLEX DISCHARGE).**
Doctoral thesis in French,
by Michel Gregoire. 1965, 75p CEA-R-2822
Text in French; Attached Summary in English.
Distribution: No limitation.

Descriptors: (*Cathodes, Electric discharges), (*Electric discharges, Cathodes), Plasma physics, Magnetic fields, Stability.

The cold cathode reflex discharge develops a cathode sheath of several hundreds of volts, which accelerates electrons released from the cathode to high velocities along the lines of the axial magnetic field. On the studies pressure range (4.10 to the minus 4th power torr $< p <$ 2.10 to the minus 2 power torr) the plasma density is about 10 to the 11th power/cu. cm. Under certain conditions high frequency (1 -- 5000 MHz) instabilities appear. These instabilities are found to profoundly modify the mean characteristics of the discharge. In particular, particle flow accross the lines of magnetic field is found to be considerably greater than that predicted by classical diffusion theory. Theoretical considerations are presented with complementary experimental results. They show that the high frequency instabilities are a result of the fast electronic assembly accelerated through the cathode sheath. (Author)

**PB-168 773** **Field 20M, 1A**
**CFSTI Prices: HC$3.00 MF$0.75**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**ETUDES THEORIQUE ET EXPERIMENTALE DU TRANSFERT DE CHALEUR ET DES PERTES DE CHARGE DE SURFACES MUNIES D'AILETTES DISPOSEES EN CHEVRON CORRELATION ENTRE PARAMETRES GEOMETRIQUES ET AEROTHERMIQUES (THEORETICAL AND EXPERIMENTAL STUDY OF HEAT TRANSFERS AND PRESSURE DROPS ALONG SURFACES FITTED WITH HERRING-BONE FINS; CORRELATION BETWEEN GEOMETRIC AND AEROTHERMAL PARAMETERS),**
by Jacques Pelce, Jean Malherbe, and Bernard Pierre. Oct 65, 75p CEA-R-2471
Text in French; Attached Summary in English.
Distribution: No limitation.

Descriptors: (*Heat transfer, Aerodynamic heating), (*Fins, Heat transfer), Pressure, Surfaces, Geometric forms, France.

Principal results are given of experimental research carried out on the flow of a fluid along a surface fitted with herring-bone fins. Aerothermal tests were effected on a large number of these surfaces whose geometrical parameters were made to vary systematically. In particular, work on a large scale model has made it possible to analyse the mechanisms of heat transfer and of pressure drops. On this basis a theoretical study has led to the establishment of a correlation between the geometric configuration and the aero-thermal performances of these surfaces. Experimental results are in good agreement with the theoretical relationships. An expression was derived applicable to this type of herringboned surface in a wide zone. (Author)

**PB-168 775** **Field 20M**
**CFSTI Prices: HC$4.00 MF$0.75**
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**METHODE D'ANALYSE CALORIMETRIQUE EN REGIME VARIABLE (A METHOD FOR CALORIMETRICAL ANALYSIS IN VARIABLE CONDITIONS),**
by Guy Berthier. Nov 65, 103p CEA-R-2797
Text in French; Attached Summary in English.
Distribution: No limitation.

Descriptors: (*Calorimetry, Thermal diffusion), Transformations, High-temperature research, France.

By the analysis of the transitory thermal conditions given by the quenching of a sample in a furnace maintained at a high temperature, it is possible to study the thermal diffusivity of some materials, and that of solid state structure transformation on a qualitative as well as a quantitative standpoint. For instance, the transformation energy of alpha-quartz into beta-quartz and the Wigner energy stored within neutron-irradiated beryllium oxide was measured. (Author)

## 21. PROPULSION AND FUELS

**GEMP-359** **Field 21F, 18L, 18I**
**CFSTI Prices: HC$4.00 MF$1.00**
General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
**630A MARK V MARITIME NUCLEAR STEAM GENERATOR DESIGN STUDIES SUMMARY. 630A PROGRAM OPERATION.**
31 Mar 65, 101p
Contract AT (40-1)-2847
Distribution: No limitation.

Descriptors: (*Nuclear power plants, Steam power plants), (*Marine nuclear propulsion Design).

N65-17256 Field 21I
CFSTI Prices: HC$2.00 MF$0.50
Harris Research Lab., Inc., Washington, D. C.
**STUDIES OF INTERFACIAL SURFACE ENERGIES,**
Summary rept.,
by George A. Lyerly and Henry Paper. 31 Dec 64, 12p
Contract NAS3 5744
NASA CR-54175
Distribution: No limitation.

Descriptors: (*Surface tension, Liquid rocket fuels), (*Liquid rocket fuels, Surface tension).

N65-19265 Field 21E
CFSTI Prices: HC$4.00 MF$1.00
AVCO Corp., Wilmington, Mass. Research and Advanced Development Div.
**RESISTOJET RESEARCH AND DEVELOPMENT. PHASE II.**
Quarterly progress rept. no. 2, 1 Oct-31 Dec 64,
by Richard R. John and Dean Morgan. 20 Jan 65, 121p AVCO-RAD-SR-65-44
Contract NAS3-5908
NASA CR-54333
Distribution: No limitation.

Descriptors: (*Jet engines, Experimental design).

N65-24058 Field 21E
CFSTI Prices: HC$3.00 MF$0.50
National Aeronautics and Space Administration. Cleveland, Ohio. Lewis Research Center.
**SOME DESIGN PRINCIPLES FOR TURBOJET COMBUSTORS OPERATING ON BORON-CONTAINING FUELS,**
by Warner B. Kaufman. Jun 59, 55p NASA-MEMO-6-3-59E
Distribution: No limitation.

Descriptors: (*Turbojet engines, Design), (*Jet engine fuels, Boron).

N65-24388 Field 21C
CFSTI Prices: HC$2.00 MF$0.50
Space Sciences Lab., Univ. of California, Berkeley.
**INVESTIGATION OF KILOVOLT ION SPUTTERING.**
Quarterly progress rept.,
by Harold P. Smith, Jr. and F. C. Hurlbut. 30 Apr 65, 31p
Contract NAS3 5743
NASA CR-54406
Distribution: No limitation.

Descriptors: (*Ion engines, Electrodes), (*Electrodes, Erosion).

N65-25276 Field 21C
CFSTI Prices: HC$4.00 MF$0.75
Astro Met Associates, Inc., Cincinnati, Ohio.
**DEVELOPMENT OF LARGE SIZE FINISHED POROUS TUNGSTEN IONIZERS.**
Final rept.,
by John W. Graham and Baj K. Malik. 18 Mar 65, 110p Rept. no. Astro-Met-9-X-0032
Contract NAS3 4115
NASA CR-54189
Distribution: No limitation.

Descriptors: (*Thermionic emission, Tungsten), (*Ion engines, Thermionic emission).

N65-28446 Field 21I
CFSTI Prices: HC$2.00 MF$0.50
National Advisory Committee for Aeronautics, Lewis Research Center, Cleveland, Ohio.
**ANALYSIS OF FLOURINE ADDITION TO THE VANGUARD FIRST STAGE.**
Research memo.,
by William A. Tomazic, Harold W. Schmit, and Albert O. Tischler. 24 Jan 57, 29p NACA RM-E56K28
Distribution: No limitation.

Descriptors: (*Oxidizers, Fluorine), (*Fluorine, Oxidizers).

Identifiers: VANGUARD.

N65-33543 Field 21E
CFSTI Prices: HC$4.00 MF$1.00
Purdue Univ., Lafayette, Ind.
**AN EXPERIMENTAL INVESTIGATION OF THRUST VECTOR CONTROL BY SECONDARY INJECTION,**
by Richard D. Guhse. Sep 65, 124p
Grant NsG-592
NASA CR-297
Distribution: No limitation.

Descriptors: (*Thrust vector control systems, Secondary injection), (*Secondary injection, Thrust vector control systems).

Patent 3,216,120 Field 21H
**PROFILOMETER ASSEMBLY.**
Patent assigned to Army,
by David J. Sweigart and Philip W. Carmack. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Meters, Rocket motors (Solid propellant)), (*Rocket motors (Solid propellant), Rocket propellant grains), Surface properties, Patents.

Identifiers: Profilometers.

The profilometer is for use in inspecting the internal longitudinal profile of the grain cavity of a large solid propellant motor. The boom type profilometer utilizes a plurality of radially extending spring biased probe elements to indicate the surface of the propellant grain adjacent the grain cavity in a single pass. Light sensitive elements emit a recordable signal commensurate with probe movement.

Patent 3,217,017 Field 21I
**CYCLOPENTADIENE HEXAAZIDE AND PROCESS.**
Patent assigned to Air Force,
by William L. Stepp. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Fuel additives, Azides), (*Propellants, Fuel additives), (*Azides, Synthesis (Chemistry)), (*Cyclopentenes, Synthesis (Chemistry)), Dienes, Halogenated hydrocarbons, Sodium compounds, Patents.

Identifiers: Cyclopentadiene hexaazides.

Cyclopentadiene hexaazide is useful as a special additive to propellants. It is prepared by reacting hexachlorocyclopentadiene with sodium azide in an organic and inert solvent for the reactants.

Patent 3,217,488 Field 21C, 21E
**GAS COOLED COLLOID PROPULSION SYSTEM.**
Patent assigned to Air Force,
by Hans J. P. Von Ohain, Maurice O. Lawson, and Siegfried H. Hasinger. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Propulsion, Colloids), (*Colloids, Propulsion), Nozzles, Vapors, Design, Patents, Electrodes, Cooling.

Identifiers: Colloid engines.

The colloid propulsion system uses gas-cooled condensation droplets. The system includes a housing, a supply tank for mercury vapor, a heat exchanger and a chamber leading to nozzle structure. A liquid hydrogen supply feeds gas to the expansion nozzle system. Charged particles then enter an accelerating field between two grids where the droplets are accelerated to final velocity.

Patent 3,217,651 Field 21I
**MULTIPLE PROPELLANT GRAIN FOR ROCKET MOTORS.**
Patent assigned to Air Force,
by James V. Braun and Willard S. Bacon. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Rocket propellant grains, Geometric forms), Rocket motors, Patents, Burning rate.

The cylindrically shaped rocket motor charge has a flat circular base at one end and a semispherical portion at the end remote from the base. It is composed of a plurality of propellants of prescribed and graduated burning rates, advantageous contours and dimensions such that the burning of all of the propellants in a grain ends at the same time. This result is accomplished by designing the propellants as long cone structures with sharp edges and points and with mathematically determined inclinations and proportionate dimensions.

PB-168 676 Field 21B, 21E
CFSTI Prices: HC$3.00 MF$0.75
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
**FLAME STABILIZATION ON BLUFF BODIES AT LOW AND INTERMEDIATE REYNOLDS NUMBERS,**
by Edward Edom Zukoski. 30 Jun 54, 54p Rept. no. 20-75
Contract DA-04-495-ORD-18,
Proj. ORDCIT
AD 56 177
Distribution: No limitation.

Descriptors: (*Combustion, Stability), (*Flames, Stabilization), (*Ramjet engines, Combustion), (*Turbojet engines, Combustion), Reynolds number, Laminar flow, Turbulence, Diffusion, Ignition, Blunt bodies.

The problem of attaining stable combustion in ramjet power plants and in afterburners of turbojet engines has led to extensive studies of the processes involved in stabilizing flames on bluff bodies. One of the results of these studies was to indicate that the flame-stabilization mechanism changes significantly at low Reynolds numbers; the velocity at which flames may be stabilized drops abruptly as the Reynolds number is decreased and the mixture ratio for which maximum velocity of flame holding occurs shifts markedly from the stoichiometric value. This abrupt change in the mechanism of flame stabilization is investigated through photographic studies of the flame front near the flame holder. A transition from a laminar to a turbulent surface of the flame front immediately downstream from the flame holder is shown to account for the change in flame-stabilization characteristics. This transition was found to occur independently of fuel type and flameholder geometry. The behavior of the low-Reynoldsnumber stabilization limits is attributed to a diffusion process; in particular, the shift found for the mixture ratio corresponding to the maximum blowoff velocity is explained on the basis of the difference in the diffusion rate of fuel and oxygen. Detailed experiments including blowoff results, chemical analysis of gas taken from the flame-holder wake, and measurements of wake temperatures are shown to confirm the suggested diffusion mechanism. Once the transition phenomenon is appreciated, re-examination of high Reynolds number blowoff data is found possible. (Author)

PB-168 752 Field 21I
CFSTI Prices: HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.

**A GENERAL METHOD OF CALCULATING THE PERFORMANCE OF PROPELLANT SYSTEMS CONTAINING THE ELEMENTS C, H, O, N, F, AND ONE OTHER HALOGEN,**
by C. A. Seafeldt. 8 Jul 57, 34p Memo-20-144
Contract DA-04-495-ORD-18,
Proj. ORDCIT
AD 147 180
Distribution: No limitation.

Descriptors: (*Rocket propellants, Performance (Engineering)), Mathematical analysis, Iterative methods, Thermodynamics, Combustion chambers, Rocket motor nozzles, Carbon, Hydrogen, Nitrogen, Fluorine, Halogens.

A detailed method is presented for calculating the performance of rocket-propellant systems containing any or all of the components C, H, O, N, F and one additional halogen Y. The method outlined has been successively programmed for the Datatron digital computer at the Jet Propulsion Laboratory and has provided several hundred solutions. A three-cycle iterative scheme has been developed which is used in solving the simultaneous Equations involving composition and temperature. Solutions are made at the combustion chamber, the nozzle exit, and the throat. Following these iterations, a straightforward computation obtains the performance parameters. The existing program has provisions for the introduction of phase-changing frozen compounds in addition to the components entering into the equilibria. (Author)

**PB-168 765** **Field 21F, 21I**
**CFSTI Prices: HC$2.00 MF$0.50**
RAND Corp., Santa Monica, Calif.
**A PARAMETRIC STUDY OF CERTAIN LOWMOLECULAR-WEIGHT COMPOUNDS AS NUCLEAR ROCKET PROPELLANTS. I. HYDROGEN,**
by F. J. Krieger. 30 Jun 59, 38p Research memo. no. RM-2400
AD 231 761
Distribution: No limitation. Rept. on proj. RAND.

Descriptors: (*Nuclear propulsion, Rocket propellants), (*Rocket propellants, Hydrogen), Thermodynamics, Performance (Engineering), Rocket motor nozzles, High-temperature research, Exhaust gases.

The purpose of this study was the parametric investigation of a series of low-molecular-weight, high-hydrogencontent compounds as propellants for nuclear-powered rockets. The chemical compounds include hydrogen (H2), ammonia (NH3), water (H20), lithium hydride (LiH), methane (CH4), and methanol (CH3OH). A two-part computational program was carried out for each compound; the results are presented in both tabular and graphic form. The results of the first part of the program are represented in static form, i.e., by the conventional Mollier diagram, in which specific enthalpy is plotted against specific entropy, with cross plots of temperature, pressure, and molecular weight. The results of the second part of the program are represented in dynamic form by a series of diagrams in which specific impulse is plotted against pressure, with cross plots of chamber temperature, exhaust temperature, and rocket-nozzle area. It was assumed that the propellant gas, starting with a nonzero chamber velocity, maintained instantaneous chemical equilibrium composition as it expanded isentropically through a de Laval nozzle. Because of the voluminous nature of the computations and the graphical presentation of the information derived, the results of the investigation are issued in separate reports for each propellant. This report the first of the series presents the results for Hydrogen. (Author)

## 22. SPACE TECHNOLOGY

**N65-15401** **Field 22A, 17G**
**CFSTI Prices: HC$1.00 MF$0.50**
Chrysler Corp., Detroit, Mich. Missile Div.
**STUDY IN MULTIVARIATE APPROXIMATIONS FOR STEERING AND OTHER CONTROL FUNCTIONS IN SPACE FLIGHT OPERATIONS OF SATURN TYPE VEHICLES,**
Final rept.,
by R. J. Vance. Nov 64, 20p AM-TR-2-64
Contract NAS8-11049
NASA CR-60351
Distribution: No limitation.

Descriptors: (*Space flight, Guidance), (*Guidance, Space flight).

**N65-16475** **Field 22**
**CFSTI Prices: HC$3.00 MF$0.75**
California Univ., Berkeley. Space Sciences Lab.
**CONSOLIDATED QUARTERLY PROGRESS REPORT, PERIOD ENDING FEBRUARY 1, 1964.**
24 Jan 64, 62p
Grants NSG-10-59, NSG-101-61
NASA CR-53542
Distribution: No limitation.

Descriptors: (*Space flight, Scientific research).

**N65-16828** **Field 22B, 22A**
**CFSTI Prices: HC$7.00 MF$1.75**
Research and Advanced Development Div. AVCO Corp., Wilmington, Mass.
**MARS-VENUS CAPSULE PARAMETER STUDY. VOLUME III. VENUS RESULTS.**
16 Jan 64, 360p RAD-TR-64-1
Contract JPL-950626
NASA CR-53673
Distribution: No limitation.

Descriptors: (*Spacecraft, Venus probes), (*Venus probes, Spacecraft).

**N65-16841** **Field 22B**
**CFSTI Prices: HC$2.00 MF$0.50**
Battelle Memorial Inst., Columbus, Ohio.
**SPACE-VEHICLE STABILIZED-PLATFORM GIMBALSYSTEM WEIGHT-REDUCTION STUDY. PHASE IIDESIGN OF SPHERICAL GIMBALS,**
Summary rept. 1 Nov 62 - 30 Jun 63,
by T. J. Atterbury, G. M. McClure, and J. E. Sorenson. 2 Jul 63, 39p
Contract NAS8-5101
NASA CR-56147
Distribution: No limitation.

Descriptors: (*Spacecraft, Stabilization systems), (*Gimbals, Spacecraft).

**N65-16842** **Field 22B, 22A**
**CFSTI Prices: HC$6.00 MF$1.25**
Research and Advanced Development Div. AVCO Corp., Wilmington, Mass.
**MARS-VENUS CAPSULE PARAMETER STUDY. VOLUME II- MARS RESULTS.**
16 Jan 64, 233p RAD-TR-64-1, Vol. 2
Contract JPL-950626
NASA CR-53672
Distribution: No limitation.

Descriptors: (*Mars probes, Spacecraft), (*Spacecraft, Mars probes).

**N65-16989** **Field 22A**
**CFSTI Prices: HC$3.00 MF$0.50**
Indiana Univ., Bloomington. Bureau of Business Research.
**AEROSPACE RESEARCH APPLICATIONS CENTER.**
Summary rept., 1 Apr-30 Jun 63,
by A. M. Weimer. 10 Jan 63, 58p
Contract NASR-162
NASA CR-51214
Distribution: No limitation. Process of Conference on Indiana Application of Aerospace Research.

Descriptors: (*Astronautics, Scientific research).

**N65-17260** **Field 22B, 4A**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**INSTRUMENTATION AND FLIGHT REPORT ON AEROBEE FLIGHTS 4.107 GE AND 4.108 GE,**
by J. W. Cameron. Feb 65, 74p Rept. nos. K-671-65-55; TMX-55127
Distribution: No limitation.

Descriptors: (*Sounding rockets, Instrumentation), (*Atmospheric sounding, Sounding rockets).

Identifiers: Aerobee.

**N65-17261** **Field 22C, 22A**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**IMP-C ORBIT AND LAUNCH TIME ANALYSIS,**
by Stephen J. Paddack and Barbara E. Shute. Jan 65, 66p Rept. nos. X-643-65-4; TMX-55128
Distribution: No limitation.

Descriptors: (*Astronautics, Launching), (*Space probes, Launching).

**N65-17534** **Field 22B**
**CFSTI Prices: HC$1.00 MF$0.50**
IIT Research Inst., Chicago, Ill.
**APPLICATION OF PRESTRESSED SEGMENTED BRITTLE MATERIALS IN AEROSPACE STRUCTURE.**
Quarterly status rept., no. 7, Nov 1 64-Jan 31 65,
by P. C. Hermann. 15 Feb 65, 9p
Contract NASR-65 (04)
NASA CR-60853
Distribution: No limitation.

Descriptors: (*Spacecraft components, Materials), (*Airframes, Materials).

**N65-18936** **Field 22B**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**COMPILATION OF CALIBRATION DATA FOR AEROBEE FLIGHT 4.13 GP-GT,**
by L. C. Castagnola. Mar 65, 54p NASA-TM-X-55175; X-671-65-96
Distribution: No limitation.

Descriptors: (*Sounding rockets, Calibration).

Identifiers: Aerobee.

**N65-19882** **Field 22B, 9F**
**CFSTI Prices: HC$2.00 MF$0.50**
ADCOM, Inc., Cambridge, Mass.
**COMMAND SYSTEM STUDY FOR THE OPERATION AND CONTROL OF UNMANNED SCIENTIFIC SATELLITES. UNIFIED TRACKING/COMMAND/TELEMETRY AT LUNAR DISTANCES.**
Quarterly rept. no. 1, 30 Jun-30 Sep 64,
by A. M. Manders and S. M. Sussman. 30 Sep 64, 50p
Contract NAS5 9705,
Task I
NASA CR-57510
Distribution: No limitation. Microfilmed from best available copy.

Descriptors:(*Command + control systems, Scientific satellites), (*Scientific satellites, Command + control systems).

**N65-19958** **Field 22B**
**CFSTI Prices: HC$1.00 MF$0.50**
Lamont Geological Observatory, Palisades, N. Y.

**DESIGN AND CONSTRUCTION OF A LUNAR SEISMOGRAPH.**
Progress rept. no. 10, 1-Oct 61-31 Dec 61.
31 Dec 61, 5p Progress rept. no. 10
Contract NASw82
NASA CR-60891
Microfilmed from best available copy. Distribution: No limitation.

Descriptors: (*Lunar probes, Seismographs), (*Seismographs, Lunar probes).

**N65-20103** **Field 22A, 17B**
**CFSTI Prices: HC$3.00 MF$0.50**
Astro-Electronics Div., Radio Corp. of America, Princeton, N. J.
**TIGRIS (TELEVISED IMAGES OF GASEOUS REGIONS IN INTERPLANETARY SPACE) TELEVISION CAMERA SYSTEM.**
Final engineering rept. Oct 63-Oct 64.
15 Jan 65, 60p AED-R-2583
Contract NASw-823
NASA CR-57532
Distribution: No limitation.

Descriptors: (*Space probes, Television communication systems), (*Television communication systems, Space probes).

**N65-20415** **Field 22A, 17B**
**CFSTI Prices: HC$2.00 MF$0.50**
Center for Radiophysics and Space Research Cornell Univ., Ithaca, N. Y.
**REPORT OF FIELD TEST FOR TIGRIS.**
Jan 65, 32p CRSR-187
NASA CR-57621
Distribution: No limitation.

Descriptors: (*Space probes, Television communication systems), (*Television communication systems, Space probes).

**N65-22134** **Field 22D**
**CFSTI Prices: HC$3.00 MF$0.75**
Fairchild Space and Defense Systems, Syosset, N. Y.
**SATURN SWITCH SELECTOR. PHASE II: COMPLETION REPORT,**
by T. Palamenghi and C. Rasmussen. 12 Mar 65, 72p Rept. no. SME-AK-8
Contract NAS8 11683
NASA CR-62294
Distribution: No limitation.

Descriptors: (*Launch vehicles (Aerospace), Circuits), (*Circuits, Launch vehicles (Aerospace)).

Identifiers: Saturn (Booster).

**N65-22373** **Field 22B**
**CFSTI Prices: HC$4.00 MF$1.00**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**ELECTRONIC TEST PROCEDURES FOR THE ENVIRONMENTAL DESIGN QUALIFICATION AND FLIGHT TESTING OF THE UK-2/S-52,**
by Harry W. Leverone and Nathan Mandell. 15 Feb 63, 146p NASA-TM-X-55210: X-324-63-113
Distribution: No limitation.

Descriptors: (*Spacecraft, Test methods).

**N65-22567** **Field 22A, 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**SATELLITE SITUATION REPORT, VOL. 5, NO. 4,**
28 Feb 65, 20p NASA-TM-X-56347; X-533-63-1
Distribution: No limitation.

Descriptors: (*Satellites (Artificial), Experimental data), Orbital trajectories.

**N65-23189** **Field 22D**
**CFSTI Prices: HC$2.00 MF$0.50**
Chrysler Corp., Huntsville, Ala. Space Div.
**SA-9 VEHICLE AND LAUNCH COMPLEX, FUNCTIONAL DESCRIPTION. LAUNCH PAD ACCESSORIES, VOLUME VII.**
Apr 64, 42p HEC-D042 Vol. VII
Contract NAS8-4016
NASA CR-62514
Distribution: No limitation.

Descriptors: (*Launch vehicles (Aerospace), Operation).

**N65-23191** **Field 22D**
**CFSTI Prices: HC$3.00 MF$0.75**
Chrysler Corp., New Orleans, La. Space Div.
**SATURN I, LAUNCH VEHICLE SA-8 AND LAUNCH COMPLEX 37B FUNCTIONAL SYSTEMS DESCRIPTION. SUPPLEMENT: LEGEND AND COMPOSITE SCHEMATIC.**
Sep 64, 84p SDES-64-414
Contract NAS8-4016
NASA CR-62491
Distribution: No limitation.

Descriptors: (*Launch vehicles (Aerospace), Mechanical drawings).

Identifiers: Saturn (Booster).

**N65-24998** **Field 22D, 22B**
**CFSTI Prices: HC$7.00 MF$1.75**
General Electric Co., Philadelphia, Pa. Missile and Space Div.
**VOYAGER SPACECRAFT SYSTEM STUDY (PHASE ITITAN IIC LAUNCH VEHICLE).**
Final rept. vol. 2.
7 Aug 64, 325p GE R64SD933
Contract NAS7-100
NASA CR-62956
Distribution: No limitation.

Descriptors: (*Lunar prober, Launch vehicles (Aerospace)), (*Launch vehicles (Aerospace), Lunar probes).

Identifiers: Titan, Voyager.

**N65-26080** **Field 22B, 20C**
**CFSTI Prices: HC$1.00 MF$0.50**
Hughes Aircraft Co., Culver City, Calif.
**THE STUDY OF MULTIPACTOR BREAKDOWN IN SPACE ELECTRONIC SYSTEMS.**
Status rept. no. 4, Jan 1965.
12 Mar 65, 13p
Contract NAS5 3916
NASA CR-63387
Distribution: No limitation.

Descriptors: (*Spacecraft, Electronic equipment), (*Electronic equipment, Electric discharges).

**N65-26419** **Field 22A**
**CFSTI Prices: HC$4.00 MF$1.00**
Denver Research Inst., Colo.
**SUBCOOLED BOILING IN A NEGLIGIBLE GRAVITY FIELD.**
Final rept.,
by Thomas R. Rehm. 17 May 65, 146p Rept. no. DRI-2227
Grant NsG143 61 Supl I
NASA CR-63419
Distribution: No limitation.

Descriptors: (*Nucleate boiling, Weightlessness), (*Weightlessness, Nucleate boiling).

**N65-33842** **Field 22A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration. Langley Station, Hampton, Va. Langley Research Center.
**AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF THE MOTION OF A ROTATING SPACE STATION,**
by William M. Piland. Sep 65, 38p
NASA TN-D-2981
Distribution: No limitation.

Descriptors: (*Space stations, Rotation).

**N65-33844** **Field 22C**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
**DEVELOPMENT AND TESTING OF A PROPOSED INFRARED HORIZON SCANNER FOR USE IN SPACECRAFT ATTITUDE DETERMINATION,**
by Norman M. Hatcher, Arthur L. Newcomb, Jr., and Nelson J. Groom. Sep 65, 36p
NASA TN-D-2995
Distribution: No limitation.

Descriptors: (*Horizon scanners, Spacecraft), (*Spacecraft, Horizon scanners).

**N65-34223** **Field 22B, 4A**
**CFSTI Prices: HC$2.00 MF$0.50**
Goddard Space Flight Center, Greenbelt, Md.
**ELECTRONIC INTEGRATION OF THE UK-1 INTERNATIONAL IONOSPHERE SATELLITE,**
by J. M. Turkiewicz, C. F. Fuechsel, R. G. Martin, F. D. Piazza, and V. L. Krueger.
Sep 65, 43p
NASA TN-D-3001
Distribution: No limitation.

Descriptors: (*Atmospheric sounding, Scientific satellites), (*Scientific satellites, Atmospheric sounding).

**N65-34425** **Field 22B**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration. Langley Station, Va. Langley Research Center.
**FLIGHT PARAMETERS AND VEHICLE PERFORMANCE FOR PROJECT FIRE FLIGHT I, LAUNCHED APRIL 14, 1964,**
by William I. Scallion and John H. Lewis, Jr. Sep 65, 96p
NASA TND-2996
Distribution: No limitation.

Descriptors: (*Reentry vehicles, Aerodynamic heating).

Identifiers: Fire flight project.

**N65-35060** **Field 22A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**FIXED-BASE-SIMULATOR STUDY OF ABILITY OF PILOTS TO PERFORM SOFT LUNAR LANDINGS BY USING A SIMPLIFIED GUIDANCE TECHNIQUE,**
by G. Kimball Miller, Jr. and Herman S. Fletcher.
Oct 65, 29p NASA-TND-2993
Distribution: No limitation.

Descriptors: (*Lunar craft, Landings), (*Guidance, Performance tests), (*Pilots, Landings).

**N65-35061** **Field 22D**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**TEST-STAND STUDY OF A VEHICLE UPPER STAGE EMPLOYING A ROTATING-SOLID-ROCKET ATTITUDE CONTROL SYSTEM AND**

**A COMPARISON WITH ANALOG STUDIES,**
by A. Thomas Young and Robert L. James, Jr. Oct 65, 40p NASA-TND-2997
Distribution: No limitation.

Descriptors: (*Launch vehicles (Aerospace), Captive tests), (*Attitude control systems, Launch vehicles (Aerospace).

**N65-35062** **Field 22B, 20F**
**CFSTI Prices: HC$1.00 MF$0.50**
Goddard Space Flight Center, Greenbelt, Md.
**MACHANISMS FOR SPACECRAFT OPTICAL INSTRUMENTATION,**
by John P. Bauernschub. Oct 65, 16p NASA TND-3008
Distribution: No limitation.

Descriptors: (*Spacecraft, Optical instruments), (*Optical instruments, Spacecraft).

**N65-35066** **Field 22B**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**AN INVESTIGATION OF A DEFORMING ENERGYABSORPTION SYSTEM FOR SPACE-VEHICLE LANDINGS,**
by Robert W. Warner, Robert M. Sorenson, and Arthur J. Kaskey. Oct 65, 38p NASA-TND-3061
Distribution: No limitation.

Descriptors: (*Spacecraft components, Landing gear), (*Landing gear, Spacecraft components), (*Shock absorbers, Spacecraft components).

**N65-35402** **Field 22B**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**INVESTIGATION OF A JET CONDENSER FOR SPACE POWER,**
by Robert J. Platt, Jr. Oct 65, 36p NASA-TND-3045
Distribution: No limitation.

Descriptors: (*Condensers (Liquefiers), Spacecraft).

**N65-35517** **Field 22A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Hampton, Va. Langley Research Center.
**REMOTE PILOT-CONTROLLED DOCKING WITH TELEVISION,**
by Edward R. Long, Jr., Jack E. Pennington, and Perry L. Deal. Oct 65, 36p NASA-TND-3044
Distribution: No limitation.

Descriptors: (*Spacecraft docking, Remote control systems), (*Remote control systems, Spacecraft docking), (*Television display systems, Spacecraft docking).

**N65-35521** **Field 22B**
**CFSTI Prices: HC$1.00 MF$0.50**
Lockheed Missiles and Space Co., Sunnyvale, Calif.
**STUDY OF HEAT SHIELDING REQUIREMENTS FOR MANNED MARS LANDING AND RETURN MISSIONS.**
Summary rept.
Oct 65, 15p
Contract NAS2-1798
NASA CR-308
Distribution: No limitation.

# SUBJECT INDEX

The fields indicated here apply only to the Other Research Reports and Related Material Section (on blue paper).


| DESCRIPTOR | FLD | ACCESS. NO. |
|---|---|---|
| ABSORPTION (BIOLOGICAL) | 6 | PB-168 766 |
| ADESIVES | 11 | OTR-132 |
| AIRFRAMES | 1 | AD-491 714 |
| ALBUMINS | 6 | PB-168 579 |
| ALKALINE EARTH COMPOUNDS | 11 | PAT-3216945 |
| ALLOYS | 11 | PB-168 673 |
| ALUMINUM ALLOYS | 1 | AD-491 714 |
| | 13 | PAT-3217132 |
| | 11 | PB-168 761 |
| AMPLIFIERS | 20 | PAT-3217099 |
| AMPLITUDE MODULATION | 9 | PAT-3218578 |
| ANALOG COMPUTERS | 19 | AD-279 335 |
| ANALOG-DIGITAL COMPUTERS | 9 | AD-465 367 |
| ANTENNA CONFIGURATIONS | 9 | PAT-3218643 |
| ATMOSPHERIC MOTION | 4 | PB-168 689 |
| ATMOSPHERIC SOUNDING | 4 | PB-168 763 |
| ATOMIC ORBITALS | 7 | PB-168 774 |
| ATTACK BOMBERS | 1 | AD-467 735 |
| ATTENUATION | 9 | PAT-3217247 |
| ATTENUATORS | 9 | PB-168 658 |
| AUDIOFREQUENCY | 9 | PB-168 700 |
| AZIDES | 21 | PAT-3217017 |
| BALLISTIC CAMERAS | 16 | PB-168 672 |
| BEAMS (STRUCTURAL) | 13 | PB-168 713 |
| | 13 | PB-168 723 |
| | 20 | PB-168 737 |
| | 13 | PB-168 739 |
| | 13 | PB-168 743 |
| BEHAVIOR | 5 | AD-450 472 |
| BERYLLIUM | 11 | PB-168 772 |
| BETA-RAY SPECTROSCOPY | 20 | PB-168 563 |
| BIBLIOGRAPHIES | 11 | PB-168 649 |
| | 11 | PB-168 650 |
| | 11 | PB-168 652 |
| BIOCHEMISTRY | 6 | AD-466 946 |
| BIONICS | 6 | PAT-3218475 |
| | 13 | PB-168 744 |
| BOILER COMPOUNDS | 11 | AD-465 780 |
| BOMB RACKS | 19 | PAT-3216322 |
| BOOSTER MOTORS | 19 | AD-465 987 |
| BOUNDARY LAYER | 1 | PB-168 764 |
| BREECH MECHANISMS | 19 | PAT-3216544 |
| BRIDGES | 13 | PB-168 715 |
| | 13 | PB-168 716 |
| | 13 | PB-168 717 |
| | 13 | PB-168 718 |
| | 13 | PB-168 738 |
| BRONZE FATIGUE (MECHANICS) | 11 | PB-168 687 |
| CALORIMETRY | 20 | PB-168 775 |
| CAPACITANCE | 9 | PB-168 694 |
| CARBON | 11 | PB-168 688 |
| | 11 | PB-168 772 |
| CARBOXYLIC ACIDS | 7 | PAT-3217046 |
| CARGO SHIPS | 13 | PB-168 691 |
| CARTRIDGE CASES | 19 | PAT-3217587 |
| CARTRIDGES | 19 | AD-465 987 |
| CATHODES | 20 | PB-168 770 |
| CAVITY LINERS | 19 | PAT-3217650 |
| CERAMIC MATERIALS | 11 | AD-418 279 |
| CIVIL DEFENSE SYSTEMS | 6 | AD-469 352 |
| CLASSIFICATION | 9 | PB-168 756 |
| CLUTCHES | 19 | PAT-3216544 |
| COATINGS | 11 | OTR-131 |
| COAXIAL CABLES | 9 | PB-168 658 |
| COLLOIDS | 21 | PAT-3217488 |
| COMBUSTION | 21 | PB-168 676 |
| COMMAND AND CONTROL SYSTEMS | 9 | PB-168 600 |
| COMMUNICATION SYSTEMS | 17 | PB-168 753 |
| COMPRESSORS | 13 | PAT-3216648 |
| COMPUTERS | 5 | PB-168 614 |
| CONCRETE | 11 | AD-465 999 |
| CONDENSATION | 13 | PAT-3216648 |
| CONTAINMENT | 18 | PAT-3217471 |
| CONVERSION RATIO | 20 | PB-168 563 |
| CORROSION | 11 | OTR-133 |
| | 11 | PB-168 687 |
| | 11 | PB-168 813 |
| | 11 | PB-168 814 |
| | 11 | PB-168 816 |
| | 11 | PB-168 817 |
| | 8 | PB-168 819 |
| CORROSION INHIBITION | 11 | AD-465 780 |
| | 8 | PB-168 831 |
| | 8 | PG-168 835 |
| CORROSION STEEL | 11 | PB-168 815 |
| CORROSION-RESISTANT ALLOYS | 11 | PB-168 687 |
| CORTICOSTEROID AGENTS | 6 | AD-466 946 |
| CRYSTAL LATTICE DEFECTS | 20 | PB-168 768 |
| CURVE FITTING | 12 | PB-168 729 |
| CUTTING FLUIDS | 8 | PB-168 822 |
| CYCLOPENTENES | 21 | PAT-3217017 |
| DATA PROCESSING SYSTEMS | 9 | AD-296 473 |
| | 9 | AD-465 856 |
| DATA STORAGE SYSTEMS | 9 | PB-168 759 |
| DECAY SCHEMES | 20 | PB-168 767 |
| DESERTS | 8 | AD-466 089 |
| DIELECTRIC PROPERTIES | 11 | AD-407 959 |
| | 11 | AD-423 650 |
| | 11 | AD-424 626 |
| DIELECTRICS | 11 | AD-283 422 |
| DIET | 6 | AD-462 160 |
| DIFFRACTION | 20 | PB-168 634 |
| DIFFUSION | 20 | PB-168 768 |
| | 11 | PB-168 772 |
| DIGITAL COMPUTERS | 9 | AD-465 367 |
| DISARMAMENT | 5 | PB-168 592 |
| DISTILLATION | 13 | PB-168 839 |
| DOCUMENTATION | 5 | PB-168 593 |
| DOPPLER SYSTEMS | 17 | PB-168 602 |
| DRILLING | 8 | PB-168 843 |
| | 8 | PB-168 845 |
| | 8 | PB-168 846 |
| DRILLS | 8 | PB-168 825 |
| ECONOMICS | 5 | PB-168 605 |
| ELECTRIC CONNECTORS | 9 | PAT-3218585 |
| ELECTRIC DISCHARGES | 20 | PB-168 770 |
| ELECTROMAGNETIC WARFARE | 17 | AD-465 366 |
| ELECTROMAGNETIC WAVES | 20 | PB-168 634 |
| ELECTRON CAPTURE | 20 | PB-168 767 |
| ELECTRONICS | 9 | PB-168 611 |
| EMBEDDING SUBSTANCES | 11 | PB-168 653 |
| EMISSIVITY | 4 | PB-168 763 |
| ENERGY CONVERSION | 10 | AD-278 426 |
| | 10 | AD-278 480 |
| ENGLISH LANGUAGE | 5 | PB-168 757 |
| | 5 | PB-168 758 |
| ENZYMES | 6 | AD-466 947 |
| EXPANDED PLASTICS | 11 | PB-168 652 |
| EXTERNAL STORES | 1 | AD-467 735 |
| FATIGUE (MECHANICS) | 11 | PB-168 813 |
| | 11 | PB-168 814 |
| | 11 | PB-168 815 |
| | 11 | PB-168 816 |
| | 11 | PB-168 817 |
| | 8 | PB-168 818 |
| | 8 | PB-168 847 |
| FATTY ACID ESTERS | 7 | PAT-3217046 |
| FEED WATER | 11 | AD-465 780 |
| FERROELECTRIC MATERIALS | 11 | AD-407 959 |
| | 11 | AD-423 650 |
| | 11 | AD-424 626 |
| FILMS | 11 | OTR-133 |
| FIN-STABILIZED AMMUNITION | 19 | PAT-3217587 |
| FINS | 20 | PB-168 773 |
| FIRE EXTINGUISHERS | 13 | AD-466 694 |
| FIRE-RESISTANT MATERIALS | 11 | AD-294 677 |
| FIRING MECHANISMS (WEAPON) | 19 | PAT-3217601 |
| FLAMES | 21 | PB-168 676 |
| FLIGHT CLOTHING | 6 | AD-462 767 |
| FLOATING BODIES | 8 | PB-168 834 |
| FLORIDA | 5 | AD-466 272 |
| | 5 | AD-466 275 |
| FLUID MECHANICS | 8 | PB-168 822 |
| FLUORINE COMPOUNDS | 11 | AD-466 120 |
| FRACTURE (MECHANICS) | 11 | AD-443 654 |
| | 11 | PB-168 812 |
| | 8 | PB-168 819 |
| FREQUENCY MODULATION | 17 | PAT-3217322 |
| FRUITS | 6 | PAT-3217421 |
| FUEL ADDITIVES | 21 | PAT-3217017 |
| FUELS | 16 | PAT-3217649 |
| FURALDEHYDES | 7 | AD-465 900 |
| GAS FILTERS | 18 | PAT-3217471 |
| GAS GENERATING SYSTEMS | 7 | PAT-3216919 |
| GELATINS | 6 | PB-168 579 |
| GENERATORS | 10 | PAT-3217199 |
| GEORGIA | 5 | AD-466 273 |
| | 5 | AD-466 274 |
| GLASS TEXTILES | 11 | AD-421 884 |
| GRAPHICS | 18 | PB-168 751 |
| GUIDED MISSILE LAUNCHERS | 16 | PAT-3217599 |
| | 16 | PAT-3217900 |
| GUIDED MISSILE TRAJECTORIES | 16 | PB-168 672 |
| GUIDED MISSILE WARHEADS | 16 | PAT-3216321 |
| GUIDED MISSILES | 16 | PAT-3217649 |
| GYROSCOPES | 17 | AD-466 889 |
| HARTREE-FOCK APPROXIMATION | 7 | PB-168 774 |
| HEALTH PHYSICS INSTRUMENTATION | 6 | AD-469 352 |
| HEART | 6 | PB-168 862 |
| HEAT TRANSFER | 20 | PB-168 710 |
| | 20 | PB-168 773 |
| HEAT-RESISTANT METALS + ALLOYS | 11 | PB-168 849 |
| HEAT-RESISTANT PLASTICS | 11 | PB-168 656 |
| HELIUM | 7 | PB-168 774 |
| HIGH-EXPLOSIVE AMMUNITION | 19 | PAT-3217650 |
| HULLS (MARINE) | 8 | PB-168 834 |
| HUMAN ENGINEERING | 5 | AD-449 484 |
| | 5 | PB-168 755 |
| HURRICANE TRACKING | 4 | PB-168 363 |
| | 4 | PB-168 380 |
| | 4 | PB-168 689 |
| HYDRAULIC FLUIDS | 11 | AD-294 677 |
| HYDROGEN | 8 | PB-168 801 |
| IMPEDANCE BRIDGES | 9 | PB-168 662 |
| | 9 | PB-168 693 |
| INCOMPRESSIBLE FLOW | 14 | AD-457 110 |
| INDEXES | 5 | PB-168 683 |
| | 5 | PB-168 686 |
| INDUCTANCE | 9 | PB-168 694 |
| INFLATABLE STRUCTURES | 6 | AD-462 623 |
| INFORMATION RETRIEVAL | 5 | PB-168 593 |
| | 5 | PB-168 614 |
| | 9 | PB-168 759 |
| INFORMATION THEORY | 17 | PB-168 753 |
| INFRARED RADIATION | 20 | PAT-3217596 |
| INLAND WATERWAYS | 13 | PB-168 718 |
| INPUT-OUTPUT DEVICES | 9 | AD-465 856 |
| INSTRUMENTATION | 8 | PB-168 841 |
| INSULIN | 6 | PB-168 579 |
| INTEGRATED CIRCUITS | 9 | AD-448 747 |
| INTERFEROMETERS | 20 | PAT-3217591 |
| INTRARED EQUIPMENT | 5 | PB-168 668 |
| INVERTER CIRCUITS | 9 | PAT-3217187 |
| IRON | 11 | PB-168 772 |
| ISOCYANATE PLASTICS | 11 | PAT-3217003 |
| LAMINAR BOUNDARY LAYER | 1 | AD-472 659 |
| LAMINAR FLOW | 1 | AD-472 659 |
| LAMINATED PLASTICS | 11 | PB-168 655 |
| LANDING AIDS | 20 | PAT-3216308 |
| LEAST SQUARES METHOD | 12 | PB-168 729 |
| LENSES | 20 | PAT-3217596 |
| LIBRARIES | 5 | PB-168 614 |
| | 5 | PB-168 760 |
| LIGHT | 20 | PAT-3217099 |
| LINGUISTICS | 5 | PB-168 757 |
| LIPIDS | 6 | PB-168 579 |
| LITHIUM ALLOYS | 11 | PB-168 761 |
| LUBRICANT ADDITIVES | 8 | PB-168 831 |
| LUBRICANTS | 11 | AD-294 677 |
| MACHINE GUNS | 19 | AD-279 335 |
| MAGNESIUM ALLOYS | 11 | PB-168 761 |
| MAN-MACHINE SYSTEMS | 13 | PB-168 744 |
| | 5 | PB-168 755 |
| MANAGEMENT CONTROL SYSTEMS | 14 | AD-465 897 |
| MANAGEMENT PLANNING | 14 | AD-465 897 |
| MARAGING STEELS | 11 | AD-443 654 |
| MARINE GEOLOGY | 8 | PB-168 836 |
| MARINE METEOROLOGY | 4 | PB-168 363 |
| | 4 | PB-168 388 |
| | 4 | PB-168 608 |
| | 4 | PB-168 689 |
| MEASURING DEVICES (ELECTRICAL AND ELECTRONIC) | 9 | PB-168 584 |
| MECHANICAL ORGANS | 6 | PB-168 862 |
| METALS | 11 | OTR-133 |
| METEOROLOGICAL RADAR | 4 | PB-168 380 |
| METEOROLOGICAL SATELLITES | 4 | PB-168 604 |
| METERS | 21 | PAT-3216120 |
| | 14 | PB-168 697 |
| | 14 | PB-168 848 |
| MICROWAVES | 4 | PB-168 763 |
| MILITARY FACILITIES | 8 | AD-466 271 |
| MILITARY TRAINING | 5 | AD-466 273 |
| | 8 | AD-466 271 |
| | 5 | AD-466 272 |
| | 5 | AD-466 274 |
| | 5 | AD-466 275 |
| MIXERS (ELECTRONIC) | 9 | PAT-3215956 |
| MOLYBDENUM | 11 | OTR-131 |
| MOUNTAINS | 4 | PB-168 604 |
| NAVAL PERSONNEL | 5 | AD-465 850 |
| | 5 | AD-465 851 |
| NAVAL TRAINING | 5 | AD-466 192 |
| NAVIGATION COMPUTERS | 17 | PAT-3217146 |
| NERVE CELLS | 6 | PAT-3218475 |
| NEUTRONS | 6 | PB-168 777 |
| NICKEL ALLOYS | 11 | PB-168 687 |
| NOISE | 6 | AD-458 244 |
| NOISE (RADIO) | 9 | PB-168 584 |
| NOISE GENERATORS | 5 | AD-449 484 |
| NON-DESTRUCTIVE TESTING | 8 | PB-168 802 |
| | 8 | PB-168 803 |
| | 8 | PB-168 804 |
| | 8 | PB-168 805 |
| | 8 | PB-168 806 |
| | 8 | PB-168 807 |
| | 8 | PB-168 808 |
| | 8 | PB-168 809 |
| | 8 | PB-168 810 |
| | 8 | PB-168 811 |
| NORTH AFRICA | 8 | AD-466 206 |
| NUCLEAR PROPULSION | 21 | PB-168 765 |
| NUCLEATE BOILING | 20 | PB-168 710 |
| OCEAN CURRENTS | 8 | PB-168 826 |
| OCEANOGRAPHIC EQUIPMENT | 8 | PB-168 826 |
| OFFICER PERSONNEL | 5 | AD-465 850 |
| OHMMETERS | 9 | PB-168 659 |

| DESCRIPTOR | FLD | ACCESS. NO. |
|---|---|---|
| PYROLYTIC GRAPHITE | 11 | PB-168 688 |
| RADAR ANTENNAS | 9 | PAT-3215956 |
| RADAR EQUIPMENT | 14 | AD-466 119 |
| | 17 | PAT-3217322 |
| | 9 | PB-168 698 |
| | 9 | PB-168 701 |
| RADAR SCANNING | 4 | PB-168 380 |
| RADAR SIGNALS | 17 | AD-465 366 |
| RADAR TRACKING | 17 | PAT-3217320 |
| RADIATION MEASUREMENT SYSTEMS | 6 | AD-469 352 |
| RADIO EQUIPMENT | 9 | PB-168 601 |
| | 9 | PB-168 781 |
| RADIO INTERFEROMETERS | 17 | PAT-3217326 |
| RADIO RECEIVERS | 9 | PB-168 615 |
| RADIO TRANSMITTERS | 9 | PB-168 675 |
| RADIOACTIVE FALLOUT | 18 | PB-168 751 |
| RADIOBIOLOGY | 6 | PB-168 777 |
| RADIOFREQUENCY INTERFERENCE | 8 | PB-168 827 |
| RADIOFREQUENCY SPECTROSCOPY | 9 | PB-168 663 |
| RAMJET ENGINES | 21 | PB-168 676 |
| REACTION (PSYCHOLOGY) | 5 | AD-450 472 |
| RECORDING SYSTEMS | 14 | PB-168 779 |
| REFRACTORY MATERIALS | 11 | AD-418 279 |
| REINFORCED CONCRETE | 13 | PB-168 723 |
| REINFORCING MATERIALS | 11 | AD-465 999 |
| RELIABILITY (ELECTRONICS) | 14 | AD-466 119 |
| RESEARCH PROGRAM ADMINISTRATION | 14 | AD-465 897 |
| RHYTHM (BIOLOGY) | 6 | PB-168 766 |
| ROAD-BUILDING EQUIPMENT | 13 | PB-168 712 |
| ROADS | 13 | PB-168 719 |
| | 13 | PB-168 721 |
| | 13 | PB-168 722 |
| | 13 | PB-168 730 |
| | 13 | PB-168 731 |
| | 13 | PB-168 733 |
| | 13 | PB-168 734 |
| | 13 | PB-168 735 |
| | 13 | PB-168 736 |
| | 13 | PB-168 740 |
| | 13 | PB-168 741 |
| | 13 | PB-168 742 |
| | 13 | PB-168 744 |
| ROCKET MOTORS (SOLID PROPELLANT) | 21 | PAT-3216120 |
| ROCKET PROPELLANT GRAINS | 21 | PAT-3217651 |
| ROCKET PROPELLANTS | 21 | PB-168 752 |
| | 21 | PB-168 765 |
| RURAL AREAS | 13 | AD-466 694 |
| SATELLITE TRACKING SYSTEMS | 17 | PB-168 602 |
| SCHEDULING | 13 | PB-168 740 |
| SEMICONDUCTOR DEVICES | 9 | PB-168 699 |
| SHAFTS | 13 | PAT-3218535 |
| SHEAR STRESSES | 8 | PB-168 727 |
| SHEETS | 11 | PB-168 849 |
| SHOCK WAVES | 14 | AD-467 828 |
| SIGNAL GENERATORS | 9 | PB-168 696 |
| | 9 | PB-168 778 |
| SIGNALS | 9 | PAT-3218578 |
| SILVER | 11 | PB-168 772 |
| SIMULATORS | 5 | PB-168 668 |
| SITE SELECTION | 8 | PB-168 836 |
| SOIL MECHANICS | 13 | PB-168 731 |
| SOILS | 8 | PB-168 714 |
| | 8 | PB-168 727 |
| SOLID STATE PHYSICS | 9 | PB-168 611 |
| SPACE SURVEILLANCE SYSTEMS | 17 | PAT-3217326 |
| SPECIFICATIONS | 13 | PB-168 691 |
| SPECTRUM ANALYZERS | 9 | AD-465 367 |
| | 9 | PB-168 663 |
| SPEECH RECOGNITION | 17 | AD-288 099 |
| STEEL | 8 | PB-168 801 |
| | 11 | PB-168 812 |
| | 11 | PB-168 813 |
| | 11 | PB-168 814 |
| | 11 | PB-168 815 |
| | 11 | PB-168 816 |
| | 11 | PB-168 817 |
| STRATOSPHERE | 4 | AD-466 999 |
| STRESSES | 8 | PB-168 823 |
| | 8 | PB-168 824 |
| | 8 | PB-168 844 |
| STRUCTURES | 13 | PB-168 717 |
| | 13 | PB-168 746 |
| SUBJECT INDEXING | 5 | PB-168 683 |
| SULFONATES | 7 | AD-465 900 |
| SUPERSONIC PLANES | 1 | AD-491 714 |
| SURFACE TEMPERATURES | 4 | PB-168 590 |
| SURVEYING | 13 | PB-168 719 |
| | 13 | PB-168 744 |
| SURVIVAL KITS | 6 | AD-462 624 |
| SWEEP GENERATORS | 9 | PB-168 780 |
| SWITCHING CIRCUITS | 9 | PB-168 601 |
| SYNTHETIC RUBBER | 11 | AD-466 120 |
| OPTICAL COATINGS | 11 | PB-168 649 |
| OPTICAL SIGHTS | 20 | PAT-3216308 |
| ORGANIC NITROGEN COMPOUNDS | 11 | AD-466 120 |
| OSCILLATORS | 9 | PB-168 582 |
| | 9 | PB-168 663 |
| | 9 | PB-168 671 |
| OSCILLOGRAPHS | 9 | PB-168 669 |
| OSCILLOSCOPES | 9 | PB-168 670 |
| | 9 | PB-168 695 |
| OXYGEN | 7 | PAT-3216919 |
| PACKAGING | 13 | AD-466 694 |
| PAINT REMOVERS | 11 | PAT-3216945 |
| PARACHUTES | 1 | PAT-3218007 |
| PATTERN RECOGNITION | 9 | AD-296 473 |
| | 6 | PB-168 597 |
| PAVEMENTS | 13 | AD-466 269 |
| PHYSICS | 9 | PB-168 611 |
| PIERS | 13 | PB-168 720 |
| PILOTS | 5 | AD-442 707 |
| PIPES | 13 | PB-168 716 |
| | 8 | PB-168 802 |
| | 8 | PB-168 803 |
| | 8 | PB-168 804 |
| | 8 | PB-168 805 |
| | 8 | PB-168 806 |
| | 8 | PB-168 807 |
| | 8 | PB-168 808 |
| | 8 | PB-168 809 |
| | 8 | PB-168 810 |
| | 8 | PB-168 811 |
| | 11 | PB-168 813 |
| | 11 | PB-168 814 |
| | 11 | PB-168 815 |
| | 11 | PB-168 816 |
| | 11 | PB-168 817 |
| | 8 | PB-168 818 |
| | 8 | PB-168 819 |
| | 8 | PB-168 823 |
| | 8 | PB-168 824 |
| | 8 | PB-168 828 |
| | 8 | PB-168 829 |
| | 8 | PB-168 830 |
| | 8 | PB-168 843 |
| | 8 | PB-168 844 |
| | 8 | PB-168 845 |
| | 8 | PB-168 846 |
| PLANTS (BOTANY) | 7 | PAT-3217046 |
| PLANTS (BOTONY) | 5 | AD-466 275 |
| PLASMA GENERATORS | 20 | PAT-3218235 |
| PLASMA MEDIUM | 20 | PAT-3217591 |
| PLASMA PHYSICS | 9 | PB-168 611 |
| PLASTIC COATINGS | 11 | PB-168 654 |
| PNEUMATIC DEVICES | 6 | PB-168 862 |
| POSITIONING DEVICES (MACHINERY) | 13 | PAT-3218535 |
| POWER SUPPLIES | 10 | AD-278 426 |
| | 10 | AD-278 480 |
| | 9 | PB-168 671 |
| PRESSURE GAGES | 14 | AD-467 828 |
| PRESSURE SUITS | 6 | AD-462 767 |
| PROGRAMMING (COMPUTERS) | 13 | PB-168 712 |
| | 13 | PB-168 713 |
| | 8 | PB-168 714 |
| | 13 | PB-168 715 |
| | 13 | PB-168 717 |
| | 13 | PB-168 718 |
| | 13 | PB-168 719 |
| | 13 | PB-168 720 |
| | 13 | PB-168 721 |
| | 13 | PB-168 722 |
| | 13 | PB-168 723 |
| | 8 | PB-168 727 |
| | 12 | PB-168 729 |
| | 13 | PB-168 730 |
| | 13 | PB-168 731 |
| | 13 | PB-168 733 |
| | 13 | PB-168 734 |
| | 13 | PB-168 735 |
| | 13 | PB-168 736 |
| | 13 | PB-168 738 |
| | 13 | PB-168 739 |
| | 13 | PB-168 740 |
| | 13 | PB-168 741 |
| | 13 | PB-168 742 |
| | 13 | PB-168 743 |
| | 13 | PB-168 744 |
| | 13 | PB-168 746 |
| | 9 | PB-168 756 |
| PROGRAMMING LANGUAGES | 9 | AD-465 805 |
| PROJECTILES | 19 | PAT-3217650 |
| PROPELLANTS | 21 | PAT-3217017 |
| PROPULSION | 21 | PAT-3217488 |
| PROSTHETICS | 6 | AD-462 623 |
| PROTEINS | 6 | AD-462 160 |
| | 6 | PB-168 579 |
| PSYCHIATRY | 5 | PB-168 596 |
| PULSE AMPLIFIERS | 9 | PAT-3217180 |
| TARGETS | 5 | PB-168 668 |
| TELEMETER SYSTEMS | 9 | AD-460 324 |
| TELETYPE SYSTEMS | 17 | AD-288 099 |
| TENSIOMETERS | 8 | PB-168 832 |
| | 8 | PB-168 833 |
| TERRAIN | 5 | AD-466 272 |
| | 5 | AD-466 273 |
| | 5 | AD-466 274 |
| | 5 | AD-466 275 |
| TERRAIN MODELS | 13 | PB-168 730 |
| | 13 | PB-168 734 |
| | 13 | PB-168 735 |
| | 13 | PB-168 736 |
| TEST EQUIPMENT | 8 | PB-168 818 |
| | 8 | PB-168 847 |
| TEST EQUIPMENT (ELECTRONICS) | 9 | PAT-3217247 |
| | 9 | PB-168 659 |
| | 9 | PB-168 660 |
| | 9 | PB-168 669 |
| | 9 | PB-168 670 |
| | 9 | PB-168 693 |
| | 9 | PB-168 694 |
| | 9 | PB-168 695 |
| | 9 | PB-168 698 |
| | 9 | PB-168 699 |
| TEST FACILITIES | 14 | AD-285 168 |
| TEST SET | 9 | PB-168 701 |
| TEST SETS | 9 | PB-168 600 |
| | 9 | PB-168 601 |
| | 9 | PB-168 615 |
| | 9 | PB-168 781 |
| THERMAL ANALYSIS | 20 | PB-168 769 |
| THERMOPLASTICS | 11 | PB-168 650 |
| THERMOSETTING PLASTICS | 11 | PB-168 651 |
| TIDES | 4 | PB-168 608 |
| TITANIUM ALLOYS | 8 | PB-168 819 |
| TRANSFER TRAJECTORIES | 16 | PB-168 554 |
| TRANSMISSION LINES | 9 | PAT-3218585 |
| TREES | 6 | PB-168 766 |
| TROPICAL CYCLONES | 4 | PB-168 363 |
| | 4 | PB-168 380 |
| | 4 | PB-168 608 |
| | 4 | PB-168 689 |
| TUNGSTEN | 11 | OTR-131 |
| TUNNEL DIODES | 9 | PAT-3217180 |
| TURBOJET ENGINES | 21 | PB-168 676 |
| UNITED NATIONS | 5 | PB-168 592 |
| URBAN AREAS | 5 | AD-413 102 |
| VENUMS | 6 | AD-466 947 |
| | 6 | AD-466 948 |
| VERBAL BEHAVIOR | 5 | PB-168 596 |
| VIBRATION | 14 | PB-168 848 |
| VISION | 5 | AD-442 707 |
| VOLTAGE DIVIDERS | 9 | PB-168 661 |
| VOLTAGE REGULATORS | 9 | PB-168 700 |
| VOLTMETERS | 9 | PB-168 660 |
| WASTES (SANITARY ENGINEERING) | 13 | PB-168 839 |
| WATER SUPPLIES | 13 | PB-168 839 |
| WATER TUNNELS | 14 | AD-457 110 |
| WATER WAVES | 20 | AD-466 487 |
| WAVEGUIDE COUPLERS | 9 | PAT-3218581 |
| WEATHER FORCASTING | 4 | PB-168 590 |
| WELDING | 13 | PAT-3217132 |
| WELL LOGGING | 8 | PB-168 802 |
| | 8 | PB-168 803 |
| | 8 | PB-168 804 |
| | 8 | PB-168 805 |
| | 8 | PB-168 806 |
| | 8 | PB-168 807 |
| | 8 | PB-168 808 |
| | 8 | PB-168 809 |
| | 8 | PB-168 810 |
| | 8 | PB-168 811 |
| | 8 | PB-168 820 |
| | 8 | PB-168 821 |
| | 8 | PB-168 822 |
| | 8 | PB-168 825 |
| | 8 | PB-168 827 |
| | 8 | PB-168 828 |
| | 8 | PB-168 829 |
| | 8 | PB-168 830 |
| | 8 | PB-168 832 |
| | 8 | PB-168 833 |
| | 8 | PB-168 834 |
| | 8 | PB-168 835 |
| | 8 | PB-168 836 |
| | 8 | PB-168 841 |
| | 8 | PB-168 842 |
| | 8 | PB-168 843 |
| | 8 | PB-168 844 |
| | 8 | PB-168 845 |
| | 8 | PB-168 846 |
| | 8 | PB-168 847 |
| WIND | 4 | PB-168 604 |
| XYLENES | 7 | AD-465 900 |
| ZINC ALLOYS | 11 | PB-168 761 |

# PERSONAL AUTHOR INDEX

The fields indicated here apply only to the Other Research Reports and Related Material Section (on blue paper).


| PERSONAL AUTHOR | FLD | ACCESS. NO. |
|---|---|---|
| ABBOTT, F. R. | 9 | PB-168 675 |
| ALBERT, P. A. | 6 | AD-462 624 |
| ALLEN, J. M. | 14 | AD-457 110 |
| ANDREWS, F. | 6 | PB-168 579 |
| ANGELO, A. T. | 4 | PB-168 608 |
| ARIZONA | 8 | AD-466 206 |
| ARMSBY, D. H. | 5 | PB-168 755 |
| AROESTY, J. | 1 | AD-472 659 |
| ASQUITH, C. F. | 9 | AD-460 324 |
| BACHMAN, K. L. | 17 | AD-466 889 |
| BACON, W. S. | 21 | PAT-3217651 |
| BANKOFF, S. G. | 20 | PB-168 710 |
| BARNES, W. M. | 13 | PB-168 741 |
| BARR, W. L. | 20 | PAT-3217591 |
| BARUS, C. | 6 | PB-168 597 |
| BECK, G. A. | 9 | AD-465 805 |
| BELL, R. O. | 11 | AD-283 422 |
| BEN-AMI LIPETZ | 5 | PB-168 686 |
| BERAN, D. W. | 4 | PB-168 604 |
| BERGMAN, R. H. | 9 | PAT-3217180 |
| BERTHIER, G. | 20 | PB-168 775 |
| BODNAR, J. S. | 5 | PB-168 592 |
| BOLANDER, E. H. | 11 | AD-465 780 |
| BOLIE, V. W. | 6 | PB-168 862 |
| BOWLES, M. E. | 6 | AD-466 947 |
| BOYD, W. R. | 8 | PB-168 801 |
| BRAIN, A. E. | 9 | AD-296 473 |
| BRAUN, J. V. | 21 | PAT-3217651 |
| BRAUNSTEIN, D. N. | 5 | AD-466 192 |
| BREBEC, G. | 20 | PB-168 768 |
| BREEDING, J. E. | 20 | AD-466 487 |
| BROWN, C. L. | 11 | AD-294 677 |
| BROWN, J. H. | 6 | AD-466 947 |
| CAMPBELL, L. W. | 9 | AD-465 805 |
| CARLSON, C. E. | 13 | PB-168 731 |
| CARMACK, P. W. | 21 | PAT-3216120 |
| CARR, M. J. | 5 | AD-465 851 |
| CHANDRA, N. M. | 11 | PB-168 772 |
| CHANG, J. C. L. | 13 | PB-168 723 |
| COLE, J. D. | 1 | AD-472 659 |
| COLLINS, W. H. | 13 | PB-168 716 |
| | 13 | PB-168 739 |
| CONNER, R. D. | 5 | AD-465 850 |
| COOK, K. G. | 5 | PB-168 755 |
| COUSINS, E. W. | 13 | AD-466 694 |
| CRAFTS, H. S. | 9 | AD-296 473 |
| CRAIGHEAD, C. M. | 1 | AD-491 714 |
| CROCKETT, C. W. | 4 | PB-168 590 |
| CROSS, H. C. | 11 | PB-168 849 |
| CRUSE, R. E. | 9 | AD-465 367 |
| DALE, N. | 5 | PB-168 757 |
| DE KERVILER, H. | 6 | PB-168 777 |
| DEVENUTO, F. | 6 | AD-466 946 |
| DI BENEDETTO, B. | 11 | AD-283 422 |
| | 11 | AD-407 959 |
| DI PERRY, J. | 17 | PAT-3217320 |
| DUNN, C. R. | 4 | PB-168 590 |
| DURKEE, E. L. | 6 | PAT-3217421 |
| EASTWOOD, L. W. | 1 | AD-491 714 |
| EHLER, A. W. | 20 | PAT-3218235 |
| ELLINGHOUSEN, H. C. | 11 | PB-168 687 |
| ELLZEY, S. E. JR. | 11 | PAT-3217003 |
| ELSEA, A. R. | 8 | PB-168 801 |
| FAILS, W. A. | 17 | PAT-3217146 |
| FEIN, M. M. | 11 | AD-466 120 |
| FINNEY, A. T. | 14 | AD-465 897 |
| FISCHER, R. F. | 9 | PAT-3218581 |
| FISHER, C. J. | 9 | PB-168 675 |
| FISHER, E. L. | 4 | PB-168 363 |
| FOGLE, R. F. | 10 | AD-278 426 |
| | 10 | AD-278 480 |
| FORD, S. H. | 13 | PAT-3216648 |
| FORSEN, G. E. | 9 | AD-296 473 |
| GAGNAIRE, J. | 6 | PB-168 766 |
| GARDNER, A. L. | 20 | PAT-3217591 |
| GARDNER, D. L. | 19 | PAT-3217601 |
| GAYLORD, C. J. | 20 | PB-168 737 |
| GEBEL, R. K. H. | 20 | PAT-3217099 |
| GELFOND, D. | 19 | AD-279 335 |
| GERARD, J. M. | 6 | PB-168 766 |
| GION, E. J. | 1 | PB-168 764 |
| GRAY, W. M. | 4 | PB-168 689 |
| GREER, D. C. | 8 | PB-168 727 |
| | 13 | PB-168 738 |
| GREGOIRE, M. | 20 | PB-168 770 |
| GREGORY, W. | 11 | AD-424 626 |
| GROENEVELD, T. P. | 8 | PB-168 801 |
| GROSS, M. R. | 11 | PB-168 673 |
| GROSS, R. J. | 1 | PAT-3218007 |
| HAGNER, W. W. | 16 | PAT-3217649 |
| HALE, J. S. JR. | 13 | PB-168 746 |
| HALL, D. J. | 9 | AD-296 473 |
| HAMILTON, W. E. | 6 | PAT-3217421 |
| HANCOCK, H. M. | 13 | PB-168 733 |
| HANNAN, P. W. | 9 | PAT-3218643 |
| HARP, J. L. | 14 | AD-457 110 |
| HARRIS, M. | 11 | AD-407 959 |
| | 11 | AD-423 650 |
| | 11 | AD-424 626 |
| HARRISON, L. J. | 13 | PB-168 717 |
| | 13 | PB-168 718 |
| HARROLD, L. R. | 9 | AD-465 856 |
| HARVEY, G. G. | 9 | PB-168 611 |
| HASINGER, S. M. | 21 | PAT-3217488 |
| HASSELD, F. E. JR. | 9 | PAT-3215956 |
| HATANAKA, M. | 5 | PB-168 605 |
| HAY, D. L. | 5 | AD-450 472 |
| HAZLETT, W. H. JR. | 19 | PAT-3216322 |
| HEARLE, E. F. R. | 5 | AD-413 102 |
| HEGEDUS, J. JR. | 19 | PAT-3217587 |
| HERNER, S. | 5 | PB-168 683 |
| HERR, L. A. | 13 | PB-168 715 |
| | 13 | PB-168 716 |
| HERZBERGER, M. J. | 20 | PAT-3217596 |
| HIEBER, C. E. | 5 | PB-168 760 |
| HIGGS, R. | 4 | PB-168 388 |
| HILTZ, F. F. | 6 | PAT-3218475 |
| HISER, H. W. | 4 | PB-168 380 |
| HODGE, D. C. | 5 | AD-449 484 |
| HOEHNE, V. O. | 14 | AD-457 110 |
| HOELKER, R. F. | 16 | PB-168 554 |
| HOEPPNER, D. W. | 8 | PB-168 801 |
| | 8 | PB-168 819 |
| HOFMANN, W. P. | 13 | PB-168 731 |
| HOLTHAUS, J. E. | 13 | PAT-3218535 |
| HOTCHKISS, M. E. | 13 | PAT-3218535 |
| HOWARD, F. E. JR. | 16 | PAT-3216321 |
| HOWREY, E. P. | 5 | PB-168 605 |
| HYLER, W. S. | 8 | PB-168 819 |
| JAFFEE, J. | 5 | PB-168 596 |
| JAMPOLSKY, A. | 5 | AD-442 707 |
| JANASKE, P. C. | 5 | PB-168 593 |
| JERVIGAN, R. | 9 | PB-168 756 |
| KABELL, L. J. | 17 | PAT-3217322 |
| KAUFMAN, M. G. | 17 | PAT-3217326 |
| KERN, W. K. | 16 | PAT-3216321 |
| KILGOUR, F. G. | 5 | PB-168 614 |
| KIRSTEIN, T. C. | 6 | PB-168 862 |
| KLEIN, W. H. | 4 | PB-168 590 |
| KNOX, J. B. | 18 | PB-168 751 |
| KOCHOLATY, W. | 6 | AD-466 948 |
| KOLB, C. R. | 8 | AD-466 089 |
| | 8 | AD-466 206 |
| KOPKO, W. | 8 | PB-168 834 |
| KRIEGER, F. J. | 21 | PB-168 765 |
| KRYTER, K. D. | 6 | AD-458 244 |
| KUPETZKY, H. W. | 16 | PAT-3217900 |
| LAFLAMME, R. A. | 13 | PB-168 730 |
| | 13 | PB-168 734 |
| | 13 | PB-168 735 |
| | 13 | PB-168 736 |
| LAUTERBACH, H. J. | 16 | PAT-3217900 |
| LAWSON, H. E. | 10 | AD-278 426 |
| | 10 | AD-278 480 |
| LAWSON, M. O. | 21 | PAT-3217488 |
| LECLERC, R. V. | 8 | PB-168 714 |
| LEE, E. D. | 13 | PB-168 743 |
| LEE, T. G. | 5 | PB-168 758 |
| LEGG, E. D. | 16 | PAT-3217900 |
| LEGRAND, J. | 20 | PB-168 767 |
| LEWIS, S. O. | 14 | AD-467 828 |
| LINK, J. R. | 13 | PB-168 717 |
| LISSO, N. J. | 9 | PB-168 759 |
| LORIG, C. H. | 1 | AD-491 714 |
| LOWE, E. | 6 | PAT-3217421 |
| LYNCH, D. W. | 17 | PAT-3217326 |
| MACHANIK, J. W. | 9 | AD-296 473 |
| MACK, C. H. | 11 | PAT-3217003 |
| MAHLMAN, J. D. | 4 | PB-168 604 |
| MALHERBE, J. | 20 | PB-168 773 |
| MANKOWICH, A. | 11 | PAT-3216945 |
| MASSE, J. L. | 7 | PB-168 774 |
| MAY, C. B. | 9 | PAT-3218585 |
| MAY, C. W. | 9 | PAT-3215956 |
| MAY, R. V. JR. | 5 | AD-465 850 |
| MCMANUS, J. E. | 17 | PB-168 753 |
| MCREYNOLDS, L. C. | 13 | PB-168 743 |
| MEEKER, D. B. | 16 | PAT-3217599 |
| MEEKER, W. F. | 17 | AD-288 099 |
| MESSMER, J. B. | 17 | AD-466 889 |
| MEYERS, V. J. | 17 | AD-465 366 |
| MIERS, B. T. | 4 | AD-466 999 |
| MIFFLIN, R. W. | 9 | PAT-3218578 |
| MIGNOGNA, J. | 14 | AD-466 119 |
| MIKOLAJCZAK, K. L. | 7 | PAT-3217046 |
| MILAN, F. A. | 6 | AD-462 767 |
| MILLARD, W. W. | 6 | AD-462 623 |
| MILLER, C. L. | 13 | PB-168 730 |
| | 13 | PB-168 734 |
| | 13 | PB-168 735 |
| | 13 | PB-168 736 |
| MILLER, M. J. | 13 | AD-466 694 |
| MOLELLA, R. J. | 14 | AD-285 168 |
| MORF, T. F. | 13 | PB-168 721 |
| MORRIS, A. | 5 | AD-442 707 |
| MURRAY, A. E. | 20 | PAT-3217596 |
| NUSSET, E. E. | 10 | PAT-3217199 |
| NEALE, J. H. | 13 | PB-168 839 |
| NELSON, A. L. | 17 | AD-288 099 |
| NIELSEN, J. P. | 13 | AD-466 269 |
| NIHEN, L. E. | 13 | PB-168 734 |
| NORTHCUTT, M. J. | 20 | PAT-3216308 |
| NULL, F. E. | 16 | PAT-3216321 |
| NUTTER, P. B. | 11 | AD-407 959 |
| | 11 | AD-423 650 |
| | 11 | AD-424 626 |
| PARSIGNAULT, D. | 20 | PB-168 563 |
| PAUL, M. A. | 19 | PAT-3217650 |
| PAULING, L. C. | 19 | PAT-3217650 |
| PAYNE, W. H. | 5 | AD-466 192 |
| PEGRAM, V. | 5 | AD-450 472 |
| PELCE, J. | 20 | PB-168 773 |
| PENDERGRAFT, E. D. | 5 | PB-168 757 |
| PERSSELIN, S. F. | 13 | PB-168 719 |
| PIERRE, B. | 20 | PB-168 773 |
| PORE, N. A. | 4 | PB-168 608 |
| POTE, R. L. JR. | 13 | AD-466 694 |
| RANDALL, B. V. | 8 | PB-168 835 |
| REITER, E. R. | 4 | PB-168 604 |
| RESS, L. N. | 13 | PB-168 713 |
| | 13 | PB-168 744 |
| REYNOLDS, H. H. | 5 | AD-450 472 |
| RIEHL, H. | 4 | PB-168 388 |
| ROESCHKE, C. W. | 17 | PAT-3217322 |
| ROMINE, H. E. | 11 | AD-443 654 |
| ROSENFIELD, G. H. | 16 | PB-168 672 |
| ROSS, R. B. | 13 | PB-168 712 |
| ROUX-AUBERT, M. T. | 6 | PB-168 766 |
| RUETENIK, J. R. | 14 | AD-467 828 |
| RUPPRECHT, G. | 11 | AD-283 422 |
| RYAN, E. J. | 19 | PAT-3216544 |
| SANDAHL, H. E. | 8 | PB-168 714 |
| SCHILLINGER, D. E. | 13 | PAT-3217132 |
| SCHLITT, H. C. | 13 | PB-168 744 |
| SCHLITT, H. G. | 13 | PB-168 713 |
| SCHMITZ, G. K. | 11 | AD-421 884 |
| SCHNEIDER, W. P. | 8 | PB-168 821 |
| SCHULDINER, S. | 7 | PAT-3216919 |
| SCHUMANN, J. R. | 6 | AD-462 623 |
| SCOTT, P. B. | 17 | AD-288 099 |
| SEAFELDT, C. A. | 21 | PB-168 752 |
| SENN, H. V. | 4 | PB-168 380 |
| SHAMBURGER, J. H. | 8 | AD-466 206 |
| SIDES, J. D. | 8 | PB-168 836 |
| SILBER, R. | 16 | PB-168 554 |
| SILVER, H. | 14 | AD-465 897 |
| SILVERMAN, J. | 5 | AD-465 851 |
| SILVERMAN, L. | 18 | PAT-3217471 |
| SIMMONS, W. F. | 11 | PB-168 849 |
| SIMS, D. | 8 | PB-168 820 |
| SLATON, W. | 8 | PB-168 827 |
| SLICER, J. S. | 13 | AD-466 694 |
| SMITH, J. B. | 13 | AD-466 694 |
| SMITH, J. C. | 9 | PB-168 759 |
| SMUK, J. M. | 7 | AD-465 900 |
| SODERHOLM, R. B. | 5 | AD-449 484 |
| SOORIAN, D. A. | 9 | PAT-3218581 |
| STACHLIN, J. H. | 13 | PAT-3218535 |
| STALLKNECHT, A. R. | 13 | PB-168 720 |
| STEPP, W. L. | 21 | PAT-3217017 |
| STONE, A. M. | 17 | PB-168 602 |
| STROBEL, G. C. | 13 | PB-168 713 |
| SWEIGART, D. J. | 21 | PAT-3216120 |
| TABER, R. N. | 9 | PAT-3217247 |
| TAYLOR, J. G. | 4 | PB-168 608 |
| TAYLOR, R. S. | 5 | PB-168 760 |
| TENNENT, R. C. | 13 | PB-168 715 |
| | 13 | PB-168 716 |
| | 13 | PB-168 717 |
| TONKING, W. H. | 8 | PB-168 842 |
| VALCIK, L. | 17 | PB-168 753 |
| VAN LOPIK, J. R. | 8 | AD-466 089 |
| | 8 | AD-466 206 |
| VANDERSLICE, W. D. | 13 | PB-168 722 |
| VANECHO, J. A. | 11 | PB-168 849 |
| VAUGHAN, D. A. | 6 | AD-462 160 |
| VAUGHAN, L. N. | 6 | AD-462 160 |
| VERNOIS, G. | 20 | PB-168 769 |
| VEST, R. W. | 11 | AD-418 279 |
| VLIET, J. | 13 | PB-168 719 |
| VON OHAIN, H. J. P. | 21 | PAT-3217488 |
| WAUGH, J. S. | 11 | AD-283 422 |
| | 11 | AD-423 650 |
| | 11 | AD-424 626 |
| WEIFFENBACH, G. C. | 17 | PB-168 602 |
| WELTY, K. H. | 13 | PB-168 718 |
| WENGER, M. J. | 19 | PAT-3216322 |
| WESTPHAL, U. | 6 | AD-466 946 |

| PERSONAL AUTHOR | FLD | ACCESS. NO. |
|---|---|---|
| WHEELER, H. A. | 9 | PAT-3218643 |
| WHITACRE, G. R. | 14 | AD-457 110 |
| WHITE, E. | 8 | PB-168 819 |
| WHITE, E. L. | 8 | PB-168 801 |
| WHITE, J. C. | 7 | PAT-3216919 |
| WIESNER, J. B. | 9 | PB-168 611 |
| WILLIAMSON, G. R. | 11 | AD-465 999 |
| WINTER, W. | 11 | AD-283 422 |
| WOLTERMAN, A. J. | 9 | PAT-3217187 |
| WOODS, D. F. | 19 | AD-465 987 |
| WOOLDRIDGE, G. | 4 | PB-168 604 |
| YEAGER, P. | 13 | PB-168 743 |
| ZIMMERMAN, H. J. | 9 | PB-168 611 |
| ZOCH, L. L. | 7 | AD-465 900 |
| ZUKUSKI, E. E. | 21 | PB-168 676 |

# CORPORATE SOURCE INDEX

The fields indicated here apply only to the Other Research Reports and Related Material Section (on blue paper).


| CORPORATE SOURCE | FLD | ACCESS. NO. |
|---|---|---|
| AEROJET-GENERAL CORP., AZUSA, CALIF. | 10 | AD-278 426 |
| | 10 | AD-278 480 |
| AEROMEDICAL RESEARCH LAB (6571ST), HOLLOMAN AFB, N. MEX. | 5 | AD-450 472 |
| AEROSPACE CORP., EL SEGUNDO, CALIF. | 14 | AD-465 897 |
| AMERICAN INST. OF PHYSICS, NEW YORK. DOCUMENTATION RESEARCH PROJECT | 5 | PB-168 686 |
| AMERICAN UNIV., WASHINGTON, D. C. CENTER FOR TECHNOLOGY AND ADMINISTRATION | 5 | PB-168 593 |
| APPLIED PSYCHOLOGY CORP., ARLINGTON, VA. | 13 | PB-168 744 |
| | 5 | PB-168 755 |
| ARCTIC AEROMEDICAL LAB., FORT WAINWRIGHT, ALASKA. | 6 | AD-462 160 |
| | 6 | AD-462 623 |
| | 6 | AD-462 624 |
| | 6 | AD-462 767 |
| ARMED FORCES-NRC COMMITTEE ON VISION, WASHINGTON, D. C. | 5 | AD-442 707 |
| ARMOUR RESEARCH FOUNDATION, CHICAGO, ILL. | 17 | PB-168 753 |
| | 11 | PB-168 761 |
| ARMS CONTROL AND DISARMAMENT AGENCY, WASHINGTON, D. C. | 5 | PB-168 592 |
| ARMY BALLISTIC MISSILE AGENCY, REDSTONE ARSENAL, ALA. FUTURE PROJECTS ANALYSIS BRANCH | 16 | PB-168 554 |
| ARMY ELECTRONICS RESEARCH AND DEVELOPMENT ACTIVITY, WHITE SANDS MISSILE RANGE, N. MEX. ENVIRONMENTAL SCIENCES DIRECTORATE | 4 | AD-466 999 |
| ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS. | 8 | AD-466 089 |
| | 8 | AD-466 206 |
| ARMY MEDICAL RESEARCH LAB., FORT KNOX, KY. DEPT. OF BIOCHEMISTRY. | 6 | AD-466 946 |
| | 6 | AD-466 947 |
| | 6 | AD-466 948 |
| ARMY MISSILE COMMAND, REDSTONE ARSENAL, ALA. INSTRUMENTATION BRANCH. | 9 | AD-460 324 |
| ASSOCIATION OF AMERICAN RAILROADS CHICAGO, ILL. RESEARCH CENTER. | 11 | OTR-133 |
| AUTONETICS, ANAHEIM, CALIF. | 6 | PB-168 862 |
| BADGER (W. L.) ASSOCIATES, INC., ANN ARBOR, MICH. | 13 | PB-168 839 |
| BAKER (MICHAEL, JR.), INC., ROCHESTER, PA. | 13 | PB-168 739 |
| BALLISTIC RESEARCH LABS., ABERDEEN PROVING GROUND, MD. | 9 | AD-465 805 |
| BATTELLE MEMORIAL INST., COLUMBUS, OHIO. | 14 | AD-457 119 |
| BIOLOGICAL SCIENCES COMMUNICATION PROJECT, AMERICAN INST. OF BIOLOGICAL SCIENCES, WASHINGTON, D. C. | 5 | PB-168 593 |
| BJORKSTEN RESEARCH LABS., INC., MADISON, WIS. | 6 | PB-168 579 |
| BOEING CO. SEATTLE, WASH. AERO-SPACE DIV. | 9 | PB-168 661 |
| | 9 | PB-168 662 |
| BOEING CO., SEATTLE, WASH. AERO-SPACE DIV. | 9 | PB-168 659 |
| | 9 | PB-168 663 |
| | 9 | PB-168 669 |
| | 9 | PB-168 670 |
| | 9 | PB-168 695 |
| | 9 | PB-168 696 |
| | 9 | PB-168 700 |
| | 9 | PB-168 778 |
| | 14 | PB-168 779 |
| | 9 | PB-168 780 |
| BROWN AND ROOT, INC., HOUSTON, TEX. | 8 | PB-168 801 |
| | 8 | PB-168 802 |
| | 8 | PB-168 803 |
| | 8 | PB-168 804 |
| | 8 | PB-168 805 |
| | 8 | PB-168 806 |
| | 8 | PB-168 807 |
| | 8 | PB-168 808 |
| | 8 | PB-168 809 |
| | 8 | PB-168 810 |
| | 8 | PB-168 811 |
| | 11 | PB-168 812 |
| | 11 | PB-168 813 |
| | 11 | PB-168 814 |
| | 11 | PB-168 815 |
| | 11 | PB-168 816 |
| | 11 | PB-168 817 |
| | 8 | PB-168 818 |
| | 8 | PB-168 819 |
| | 8 | PB-168 820 |
| | 8 | PB-168 821 |
| | 8 | PB-168 822 |
| | 8 | PB-168 823 |
| | 8 | PB-168 824 |
| | 8 | PB-168 825 |
| | 8 | PB-168 826 |
| | 8 | PB-168 827 |
| | 8 | PB-168 828 |
| | 8 | PB-168 829 |
| | 8 | PB-168 830 |
| | 8 | PB-168 831 |
| | 8 | PB-168 832 |
| | 8 | PB-168 833 |
| | 8 | PB-168 834 |
| | 8 | PB-168 835 |
| | 8 | PB-168 836 |
| | 8 | PB-168 841 |
| | 8 | PB-168 842 |
| | 8 | PB-168 843 |
| | 8 | PB-168 844 |
| | 8 | PB-168 845 |
| | 8 | PB-168 846 |
| | 8 | PB-168 847 |
| BUCKNELL UNIV., LEWISBURG, PA. DEPT. OF CIVIL ENGINEERING. | 13 | PB-168 746 |
| BUREAU OF NAVAL WEAPONS, WASHINGTON, D. C. | 9 | PB-168 600 |
| | 9 | PB-168 601 |
| | 9 | PB-168 615 |
| | 9 | PB-168 658 |
| | 5 | PB-168 668 |
| | 9 | PB-168 671 |
| | 14 | PB-168 697 |
| | 9 | PB-168 699 |
| | 9 | PB-168 701 |
| | 9 | PB-168 781 |
| BUREAU OF PUBLIC ROADS, WASHINGTON, D. C. | 13 | PB-168 715 |
| | 13 | PB-168 716 |
| | 13 | PB-168 717 |
| | 13 | PB-168 718 |
| | 12 | PB-168 729 |
| | 20 | PB-168 737 |
| BUREAU OF PUBLIC ROADS, WASHINGTON, D. C. DIV. OF DEVELOPMENT | 13 | PB-168 712 |
| | 13 | PB-168 733 |
| BUREAU OF PUBLIC ROADS, WASHINGTON, D. C. ELECTRONIC DEVELOPMENT DIV. | 13 | PB-168 740 |
| BURROUGHS CORP., RADNOR, PA. | 9 | PB-168 584 |
| | 9 | PB-168 660 |
| | 9 | PB-168 698 |
| CALIFORNIA STATE DIV. OF HIGHWAYS. | 13 | PB-168 719 |
| CHICAGO UNIV., ILL. | 4 | PB-168 388 |
| CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA. | 11 | PB-168 649 |
| | 11 | PB-168 650 |
| | 11 | PB-168 651 |
| | 11 | PB-168 652 |
| | 11 | PB-168 653 |
| | 11 | PB-168 654 |
| | 11 | PB-168 655 |
| | 11 | PB-168 656 |
| | 11 | PB-168 688 |
| COLORADO STATE DEPT. OF HIGHWAYS. | 13 | PB-168 741 |
| COLORADO STATE UNIV., FORT COLLINS. DEPT. OF ATMOSPHERIC SCIENCE | 4 | PB-168 604 |
| COLORADO STATE UNIV., FORT COLLINS. DEPT. OF ATMOSPHERIC SCIENCE. | 4 | PB-168 689 |
| COMMISSARIAT A L'ENERGIE ATOMIQUE, FONTENAY-AUX-ROSES (FRANCE). CENTRE D'ETUDES NUCLEAIRES. | 20 | PB-168 769 |
| COMMISSARIAT A L'ENERGIE ATOMIQUE, GRENOBLE (FRANCE). CENTRE D'ETUDES NUCLEAIRES. | 6 | PB-168 766 |
| COMMISSARIAT A L'ENERGIE ATOMIQUE, SACLAY (FRANCE). CENTRE D'ETUDES NUCLEAIRES. | 20 | PB-168 563 |
| | 20 | PB-168 767 |
| | 20 | PB-168 768 |
| | 20 | PB-168 770 |
| | 11 | PB-168 772 |
| | 20 | PB-168 773 |
| | 7 | PB-168 774 |
| | 20 | PB-168 775 |
| | 6 | PB-168 777 |
| DEFENSE ATOMIC SUPPORT AGENCY, WASHINGTON, D. C. | 6 | AD-469 352 |
| DOUGLAS AIRCRAFT CO., INC., SANTA MONICA, CALIF. MISSILE AND SPACE SYSTEMS DIV. | 4 | PB-168 763 |
| FACTORY MUTUAL RESEARCH CORP., NORWOOD, MASS. | 13 | AD-466 694 |
| FOREST PRODUCTS LAB., MADISON, WIS. | 7 | AD-465 900 |
| HERVER AND CO., WASHINGTON, D. C. | 5 | PB-168 683 |
| HUMAN ENGINEERING LABS., ABERDEEN PROVING GROUND, MD. | 5 | AD-449 484 |
| ILLINOIS STATE DIV. OF HIGHWAYS. | 13 | PB-168 721 |
| JET PROPULSION LAB., CALIF. INST. OF TECH., PASADENA | 21 | PB-168 676 |
| JET PROPULSION LAB., CALIF. INST. OF TECH., PASADENA. | 20 | PB-168 710 |
| | 21 | PB-168 752 |
| JOHNS HOPKINS UNIV., SILVER SPRING, MD. APPLIED PHYSICS LAB. | 17 | PB-168 602 |
| LEHIGH UNIV., BETHLEHEM, PA. CENTER FOR THE INFORMATION SCIENCES | 5 | PB-168 760 |
| LEHIGH UNIV., BETHLEHEM, PA. INST. OF RESEARCH. | 1 | PB-168 764 |
| LINGUISTICS RESEARCH CENTER, UNIV. OF TEXAS, AUSTIN. | 9 | PB-168 756 |
| | 5 | PB-168 757 |
| | 5 | PB-168 758 |
| | 9 | PB-168 759 |
| MARITIME ADMINISTRATION, WASHINGTON, D. C. OFFICE OF SHIP CONSTRUCTION. | 13 | PB-168 691 |
| MASSACHUSETTS INST. OF TECH., CAMBRIDGE. PHOTOGRAMMETRY LAB. | 13 | PB-168 730 |
| | 13 | PB-168 736 |
| MASSACHUSETTS INST. OF TECH., CAMBRIDGE. AEROELASTIC AND STRUCTURES RESEARCH LAB. | 14 | AD-467 828 |
| MASSACHUSETTS INST. OF TECH., CAMBRIDGE. PHOTOGRAMMETRY LAB. | 13 | PB-168 734 |
| | 13 | PB-168 735 |
| METROLOGY ENGINEERING CENTER, BUREAU OF NAVAL WEAPONS REPRESENTATIVE, POMONA, CALIF. | 14 | PB-168 848 |
| MIAMI UNIV., CORAL GABLES, FLA. RADAR METEOROLOGICAL SECTION | 4 | PB-168 380 |
| MILMANCO CORP., RENTON, WASH. | 9 | PB-168 693 |
| MISSOURI STATE DEPT. OF HIGHWAYS. | 13 | PB-168 722 |
| MOTOROLA, INC., PHOENIX, ARIZ. SEMICONDUCTOR PRODUCTS DIV. | 9 | AD-448 747 |
| NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C. COMMITTEE ON HEARING, BIOACOUSTICS, AND BIOMECHANICS. | 6 | AD-458 244 |
| NATIONAL BUREAU OF STANDARDS, WASHINGTON, D. C. INST. FOR APPLIED TECHNOLOGY. | 11 | OTR-131 |
| | 11 | OTR-132 |
| | 11 | OTR-133 |
| NATIONAL ENGINEERING SCIENCE CO., PASADENA, | | |




799-657 O - 66 - 20

| CORPORATE SOURCE | FLD | ACCESS. NO. |
|---|---|---|
| CALIF. | 8 | PB-168 829 |
| | 8 | PB-168 830 |
| | 8 | PB-168 846 |
| NATIONAL SCIENCE FOUNDATION, WASHINGTON, D. C. | 8 | PB-168 836 |
| NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA. AERONAUTICAL ELECTRONIC AND ELECTRICAL LAB. | 14 | AD-466 119 |
| NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA. AERONAUTICAL INSTRUMENTS LAB. | 17 | AD-466 889 |
| NAVAL AIR MATERIAL CENTER, PHILADELPHIA, PA. AERONAUTICAL STRUCTURES LAB. | 14 | AD-285 168 |
| NAVAL CIVIL ENGINEERING LAB., PORT HUENEME, CALIF. | 13 | AD-466 269 |
| NAVAL ENGINEERING EXPERIMENT STATION, ANNAPOLIS, MD. | 11 | AD-294 677 |
| | 11 | PB-168 673 |
| | 11 | PB-168 887 |
| NAVAL PERSONNEL RESEARCH ACTIVITY, SAN DIEGO, CALIF. | 5 | AD-465 850 |
| | 5 | AD-465 851 |
| | 5 | AD-466 192 |
| NAVAL WEAPONS LAB., DAHLGREN, VA. | 11 | AD-443 654 |
| NAVY ELECTRONICS LAB., SAN DIEGO, CALIF. | 17 | AD-465 366 |
| | 9 | AD-465 367 |
| | 9 | AD-465 856 |
| | 9 | PB-168 675 |
| NAVY MARINE ENGINEERING LAB., ANNAPOLIS, MD. | 11 | AD-465 780 |
| NAVY MINE DEFENSE LAB., PANAMA CITY, FLA. | 20 | AD-466 487 |
| NEBRASKA STATE DEPT. OF ROADS. | 13 | PB-168 713 |
| | 13 | PB-168 744 |
| NEW YORK STATE DEPT. OF PUBLIC WORKS. | 13 | PB-168 731 |
| NEW YORK UNIV., N. Y. DEPT. OF METEOROLOGY AND OCEANOGRAPHY | 4 | PB-168 363 |
| OGDEN AIR MATERIEL AREA, HILL AFB, UTAH. AIRMUNITIONS WING | 19 | AD-465 987 |
| OHIO RIVER DIV. LABS., CINCINNATI | 11 | AD-465 999 |
| PAN AMERICAN PETROLEUM CORP., TULSA, OKLA. | 8 | PB-168 835 |
| PRINCETON UNIV., N. J. ECONOMETRIC RESEARCH PROGRAM | 5 | PB-168 605 |
| RADIO CORP. OF AMERICA, CAMDEN, N. J. DIGITAL COMMUNICATION EQUIPMENT ENGINEERING. | 17 | AD-288 099 |
| RAND CORP., SANTA MONICA, CALIF. | 5 | AD-413 102 |
| | 1 | AD-472 659 |
| | 1 | AD-491 714 |
| | 18 | PB-168 751 |
| | 21 | PB-168 765 |
| | 11 | PB-168 849 |
| RAYTHEON CO., WALTHAM, MASS. RESEARCH DIV. | 11 | AD-283 422 |
| | 11 | AD-407 959 |
| | 11 | AD-423 650 |
| | 11 | AD-424 626 |
| RCA SERVICE CO., PATRICK AFB, FLA. | 16 | PB-168 672 |
| REACTION MOTORS DIV., THICKOL CHEMICAL CORP., DENVILLE, N. J. | 11 | AD-466 120 |
| RESEARCH LAB. OF ELECTRONICS, MASS. INST. OF TECH., CAMBRIDGE. | 9 | PB-168 611 |
| RICHARDSON, GORDON AND ASSOCIATES, PITTSBURGH, PA. | 13 | PB-168 723 |
| RUMMEL, KLEPPER AND KAHN, BALTIMORE, MD. | 13 | PB-168 720 |
| SHILSTONE TESTING LAB., HOUSTON, TEX. | 8 | PB-168 831 |
| SOLAR, SAN DIEGO, CALIF. | 11 | AD-421 864 |
| SPECIAL AIR WARFARE CENTER, ELGIN AFB, FLA. COMBAT APPLICATIONS GROUP (1ST). | 1 | AD-467 735 |
| SPRINGFIELD ARMORY, MASS. RESEARCH AND DEVELOPMENT DIV. | 19 | AD-279 335 |
| SSCO STANDARDS LAB., INC., SOUTHFIELD, MICH. | 9 | PB-168 582 |
| | 9 | PB-168 694 |
| STANFORD RESEARCH INST., MENLO PARK, CALIF. | 9 | AD-296 473 |
| SWARTHMORE COLL., PA. DEPT. OF ELECTRICAL ENGINEERING | 6 | PB-168 597 |
| SYSTEMS RESEARCH LABS., INC., DAYTON, OHIO. | 11 | AD-418 279 |
| TENNESSEE UNIV., KNOXVILLE. DEPT. OF CIVIL ENGINEERING. | 8 | AD-466 271 |
| | 5 | AD-466 272 |
| | 5 | AD-466 273 |
| | 5 | AD-466 274 |
| | 5 | AD-466 275 |
| TEXACO EXPERIMENT, INC., RICHMOND, VA. | 8 | PB-168 832 |
| | 8 | PB-168 833 |
| TEXAS STATE HIGHWAY DEPT. | 8 | PB-168 727 |
| | 13 | PB-168 738 |
| THE BUDD CO., PHILADELPHIA, PA. | 8 | PB-168 847 |
| WASHINGTON STATE DEPT. OF HIGHWAYS. | 8 | PB-168 714 |
| | 13 | PB-168 743 |
| WEATHER BUREAU, WASHINGTON, D. C. TECHNIQUES DEVELOPMENT LAB. | 4 | PB-168 590 |
| | 4 | PB-168 608 |
| WILLIAM ALANSON WHITE INST., NEW YORK. | 5 | PB-168 596 |
| WILLIAMS (CLYDE) AND CO., COLUMBUS, OHIO. | 11 | OTR-131 |
| WISCONSIN STATE HIGHWAY COMMISSION. | 13 | PB-168 742 |
| YALE UNIV., NEW HAVEN, CONN. MEDICAL LIBRARY | 5 | PB-168 614 |

# CONTRACT NUMBER INDEX

The fields indicated here apply only to the Other Research Reports and Related Material Section (on blue paper).


| CONTRACT NUMBER | FLD | ACCESS. NO. |
|---|---|---|
| CONTRACT AF04(695)-469 | 14 | AD-465 897 |
| CONTRACT AF30(602)-2074 | 17 | PB-168 753 |
| CONTRACT AF33(616)-6691 | 17 | AD-288 099 |
| CONTRACT AF33(616)-7748 | 11 | AD-418 279 |
| CONTRACT AF33(616)-8499 | 14 | AD-467 828 |
| CONTRACT AF33(657)-12950 | 9 | PB-168 759 |
| CONTRACT AF49(638)-1182 | 5 | PB-168 683 |
| CONTRACT ARPA ORDER-189-61 | 1 | AD-472 659 |
| CONTRACT CWB-10879 | 4 | PB-168 604 |
| CONTRACT CWB-10932 | 4 | PB-168 763 |
| CONTRACT CWB8731 | 4 | PB-168 363 |
| CONTRACT DA-01-021-AMC-203(Z) | 14 | AD-457 110 |
| CONTRACT DA-04-495-ORD-18 | 21 | PB-168 676 |
| | 21 | PB-168 752 |
| CONTRACT DA-11-022-ORD-906 | 11 | PB-168 761 |
| CONTRACT DA-19-129-AMC-69 (X) | 11 | AD-466 120 |
| CONTRACT DA-19-129-QM-1549 | 6 | PB-168 579 |
| CONTRACT DA-22-079-ENG-333 | 8 | AD-466 271 |
| | 5 | AD-466 272 |
| | 5 | AD-466 273 |
| | 5 | AD-466 274 |
| | 5 | AD-466 275 |
| CONTRACT DA-36-039-AMC-02162 | 9 | PB-168 756 |
| CONTRACT DA-36-039-AMC-02162(E) | 5 | PB-168 757 |
| | 9 | PB-168 759 |
| CONTRACT DA-36-039-AMC02342(E) | 9 | AD-448 747 |
| CONTRACT DA-36-039-SC-78328 | 13 | PB-168 744 |
| CONTRACT DA-36-039-SC-87229 | 10 | AD-278 426 |
| CONTRACT DA-36-039-SC-7810 8 | 9 | PB-168 611 |
| CONTRACT DA-36-039-SC-7832 8 | 5 | PB-168 755 |
| CONTRACT DA-36-039-SC-7834 3 | 9 | AD-296 473 |
| CONTRACT DA-36-039-SC-8722 9 | 10 | AD-278 480 |
| CONTRACT DA-36-039-SC-8736 9 | 11 | AD-283 422 |
| CONTRACT DA-36-039-SC-8912 6 | 11 | AD-407 959 |
| | 11 | AD-423 650 |
| | 11 | AD-424 626 |
| CONTRACT DA-36-039-SC-9812 6 | 11 | AD-283 422 |
| CONTRACT NASW-6 | 20 | PB-168 710 |
| CONTRACT NBY-32287 | 13 | AD-466 694 |
| CONTRACT NONR-2300(05) | 5 | AD-442 707 |
| | 6 | AD-458 244 |
| CONTRACT NONR-3654(00) | 11 | AD-421 884 |
| CONTRACT NORD-7386 | 17 | PB-168 602 |
| CONTRACT N123(62861)35056(A | 9 | PB-168 669 |
| CONTRACT N123(62861)35056A | 9 | PB-168 661 |
| | 9 | PB-168 662 |
| | 9 | PB-168 663 |
| | 9 | PB-168 670 |
| | 9 | PB-168 695 |
| | 9 | PB-168 696 |
| | 9 | PB-168 700 |
| | 9 | PB-168 778 |
| | 14 | PB-168 779 |
| | 9 | PB-168 780 |
| CONTRACT N123(62861)35057A | 9 | PB-168 584 |
| | 9 | PB-168 660 |
| CONTRACT N123(62861)35059A | 9 | PB-168 582 |
| | 9 | PB-168 694 |
| CONTRACT N123(62861)51294A | 9 | PB-168 659 |
| CONTRACT N123(62861)51295A | 9 | PB-168 693 |
| CONTRACT N123(62861)51297A | 9 | PB-168 698 |
| CONTRACT OE-5-10-235 | 5 | PB-168 760 |
| CONTRACT PH-86-63-33 | 13 | PB-168 839 |
| CONTRACT SD-79 | 1 | AD-472 659 |
| GRANT NSF-GN-208 | 5 | PB-168 757 |
| | 9 | PB-168 759 |
| GRANT NSF-GN-308 | 9 | PB-168 756 |
| | 5 | PB-168 757 |
| | 5 | PB-168 758 |
| | 9 | PB-168 759 |
| GRANT NSF-GP-2366 | 1 | PB-168 764 |
| GRANT NSF-GP-579 | 5 | PB-168 605 |
| GRANT NSF-GS-551 | 5 | PB-168 605 |
| GRANT NSF-G14643 | 5 | PB-168 593 |
| GRANT NSF-G5945 | 6 | PB-168 597 |
| GRANT PHS-M-4548 | 5 | PB-168 596 |
| GRANT PHS-M-4571 | 5 | PB-168 596 |
| GRANT PHS-PH43-64-963 | 6 | PB-168 862 |

# ACCESSION/REPORT NUMBER INDEX

The fields indicated here apply only to the Other Research Reports and Related Material Section (on blue paper).

| ACCESSION/REPORT NO. | FLD | ACCESS. NO. |
|---|---|---|
| AAL-TDR-64-15 | 6 | AD-462 160 |
| AAL-TDR-64-22 | 6 | AD-462 623 |
| AAL-TDR-64-23 | 6 | AD-462 767 |
| AAL-TDR-64-24 | 6 | AD-462 624 |
| ABMA-DA-TM-2-59 | 16 | PB-168 554 |
| AD-134 271 | 16 | PB-168 672 |
| AD-139 978 | 11 | PB-168 687 |
| AD-147 180 | 21 | PB-168 752 |
| AD-224 736 | 16 | PB-168 554 |
| AD-231 327 | 13 | PB-168 744 |
| AD-231 761 | 21 | PB-168 765 |
| AD-235 779 | 5 | PB-168 755 |
| AD-244 887 | 17 | PB-168 753 |
| AD-244 894 | 18 | PB-168 751 |
| AD-250 373 | 6 | PB-168 579 |
| AD-252 803 | 17 | PB-168 602 |
| AD-253 561 | 9 | PB-168 611 |
| AD-278 426 | 10 | AD-278 426 |
| AD-278 480 | 10 | AD-278 480 |
| AD-279 335 | 19 | AD-279 335 |
| AD-283 422 | 11 | AD-283 422 |
| AD-285 168 | 14 | AD-285 168 |
| AD-288 099 | 17 | AD-288 099 |
| AD-294 677 | 11 | AD-294 677 |
| AD-296 473 | 9 | AD-296 473 |
| AD-407 959 | 11 | AD-407 959 |
| AD-413 102 | 5 | AD-413 102 |
| AD-418 279 | 11 | AD-418 279 |
| AD-421 884 | 11 | AD-421 884 |
| AD-423 650 | 11 | AD-423 650 |
| AD-424 626 | 11 | AD-424 626 |
| AD-44 256 | 11 | PB-168 761 |
| AD-442 707 | 5 | AD-442 707 |
| AD-443 654 | 11 | AD-443 654 |
| AD-448 747 | 9 | AD-448 747 |
| AD-449 484 | 5 | AD-449 484 |
| AD-450 472 | 5 | AD-450 472 |
| AD-457 110 | 14 | AD-457 110 |
| AD-458 244 | 6 | AD-458 244 |
| AD-460 324 | 9 | AD-460 324 |
| AD-462 160 | 6 | AD-462 160 |
| AD-462 623 | 6 | AD-462 623 |
| AD-462 624 | 6 | AD-462 624 |
| AD-462 767 | 6 | AD-462 767 |
| AD-465 366 | 17 | AD-465 366 |
| AD-465 367 | 9 | AD-465 367 |
| AD-465 780 | 11 | AD-465 780 |
| AD-465 805 | 9 | AD-465 805 |
| AD-465 850 | 5 | AD-465 850 |
| AD-465 851 | 5 | AD-465 851 |
| AD-465 856 | 9 | AD-465 856 |
| AD-465 897 | 14 | AD-465 897 |
| AD-465 900 | 7 | AD-465 900 |
| AD-465 987 | 19 | AD-465 987 |
| AD-465 999 | 11 | AD-465 999 |
| AD-466 089 | 8 | AD-466 089 |
| AD-466 119 | 14 | AD-466 119 |
| AD-466 120 | 11 | AD-466 120 |
| AD-466 192 | 5 | AD-466 192 |
| AD-466 206 | 8 | AD-466 206 |
| AD-466 269 | 13 | AD-466 269 |
| AD-466 271 | 8 | AD-466 271 |
| AD-466 272 | 5 | AD-466 272 |
| AD-466 273 | 5 | AD-466 273 |
| AD-466 274 | 5 | AD-466 274 |
| AD-466 275 | 5 | AD-466 275 |
| AD-466 487 | 20 | AD-466 487 |
| AD-466 694 | 13 | AD-466 694 |
| AD-466 889 | 17 | AD-466 889 |
| AD-466 946 | 6 | AD-466 946 |
| AD-466 947 | 6 | AD-466 947 |
| AD-466 948 | 6 | AD-466 948 |
| AD-466 999 | 4 | AD-466 999 |
| AD-467 735 | 1 | AD-467 735 |
| AD-467 828 | 14 | AD-467 828 |
| AD-469 352 | 6 | AD-469 352 |
| AD-472 659 | 1 | AD-472 659 |
| AD-491 714 | 1 | AD-491 714 |
| AD-96 177 | 21 | PB-168 676 |
| AFFDL-TDR-65-35 | 14 | AD-467 828 |
| AFMTC-TR-58-2 | 16 | PB-168 672 |
| AFSWP-1074 | 18 | PB-168 751 |
| AIP/DRP-CI-3(1964) | 5 | PB-168 686 |
| AML-TR-64-10 | 5 | AD-450 472 |
| ARL-63-116 | 11 | AD-418 279 |
| ASD-TR-61-666-PT-2 | 17 | AD-288 099 |
| ASTP-69 | 4 | PB-168 604 |
| ATI-65 076 | 11 | PB-168 849 |
| ATI-80 409 | 9 | PB-168 675 |
| AWTR-7 | 13 | PB-168 839 |
| BPR PROGRAM M-1 | 12 | PB-168 729 |
| BPR PROGRAM-HY-1 | 13 | PB-168 715 |
| BPR PROGRAM-HY-2 | 13 | PB-168 716 |
| BPR PROGRAM-HY-3 | 13 | PB-168 717 |
| BPR PROGRAM-HY-4 | 13 | PB-168 718 |
| BPR PROGRAM-ST-10 | 20 | PB-168 737 |
| BPR-PROGRAM A-1 | 13 | PB-168 712 |
| BPR-PROGRAM A-2 | 13 | PB-168 742 |
| BPR-PROGRAM A-3 | 13 | PB-168 741 |
| BPR-PROGRAM A-4 | 13 | PB-168 740 |
| BPR-PROGRAM E-1 | 13 | PB-168 721 |
| BPR-PROGRAM E-2 | 13 | PB-168 722 |
| BPR-PROGRAM E-3 | 13 | PB-168 733 |
| BPR-PROGRAM E-4 | 13 | PB-168 734 |
| BPR-PROGRAM E-5 | 13 | PB-168 736 |
| BPR-PROGRAM HA-2 | 13 | PB-168 735 |
| BPR-PROGRAM S-2 | 8 | PB-168 714 |
| BPR-PROGRAM S-3 | 13 | PB-168 731 |
| BPR-PROGRAM ST-2 | 13 | PB-168 713 |
| BPR-PROGRAM ST-3 | 13 | PB-168 738 |
| BPR-PROGRAM ST-4 | 13 | PB-168 723 |
| BPR-PROGRAM ST-5 | 13 | PB-168 739 |
| BPR-PROGRAM ST-6 | 13 | PB-168 743 |
| BPR-PROGRAM ST-7 | 13 | PB-168 746 |
| BPR-PROGRAM ST-8 | 13 | PB-168 720 |
| BPR-PROGRAM SU-1 | 13 | PB-168 744 |
| BPR-PROGRAM SU-2 | 13 | PB-168 719 |
| BPR-PROGRAM VA-1 | 13 | PB-168 730 |
| BRL-1172 SUPERSEDED | 9 | AD-465 805 |
| BRL-1273 | 9 | AD-465 805 |
| CEA-R-2447 | 20 | PB-168 769 |
| CEA-R-2471 | 20 | PB-168 773 |
| CEA-R-2621 | 11 | PB-168 772 |
| CEA-R-2631 | 20 | PB-168 563 |
| CEA-R-2797 | 20 | PB-168 775 |
| CEA-R-2813 | 20 | PB-168 767 |
| CEA-R-2822 | 20 | PB-168 770 |
| CEA-R-2825 | 6 | PB-168 766 |
| CEA-R-2831 | 20 | PB-168 768 |
| CEA-R-2855 | 7 | PB-168 774 |
| CEA-R-2891 | 6 | PB-168 777 |
| C5-1691/3111 | 6 | PB-168 862 |
| DASA-1243-REV | 6 | AD-469 352 |
| DTMB-1890 | 8 | PB-168 834 |
| EES-040037F(7) | 11 | PB-168 687 |
| EES-4E(2)66904 | 11 | PB-168 673 |
| EPD-1780 | 8 | PB-168 847 |
| ERDA-312 | 4 | AD-466 999 |
| EXP-450 | 8 | PB-168 832 |
| | 8 | PB-168 833 |
| FPL-32 | 7 | AD-465 900 |
| F65-P-33 | 8 | PB-168 835 |
| I-84 | 20 | AD-466 487 |
| IITRI-E123 | 17 | PB-168 753 |
| L-2559 | 8 | PB-168 831 |
| LRC-65-TS-4 | 9 | PB-168 759 |
| LRC-65-WAT-1 | 5 | PB-168 757 |
| LRC-65-WD-1 | 5 | PB-168 758 |
| LRC-65-WT-1 | 9 | PB-168 756 |
| MEL-209/65 | 11 | AD-465 780 |
| MEMO-20-144 | 21 | PB-168 752 |
| MEMO-30-8 | 20 | PB-168 710 |
| NADC-AI-6450 | 17 | AD-466 889 |
| NADC-EL-6513 | 14 | AD-466 119 |
| NAMC-ASL-1042 | 14 | AD-285 168 |
| NAVENGRXSTA-95-648C | 11 | AD-294 677 |
| NAVWEPS-17-20AA-25 | 14 | PB-168 779 |
| NAVWEPS-17-20AC-14 | 9 | PB-168 694 |
| NAVWEPS-17-20AE-42 | 9 | PB-168 660 |
| NAVWEPS-17-20AG-77 | 9 | PB-168 582 |
| NAVWEPS-17-20AG-80 | 9 | PB-168 696 |
| NAVWEPS-17-20AG-89 | 9 | PB-168 780 |
| NAVWEPS-17-20AH-12 | 9 | PB-168 671 |
| NAVWEPS-17-20AH-13 | 9 | PB-168 700 |
| NAVWEPS-17-20AN-08 | 9 | PB-168 661 |
| NAVWEPS-17-20AR-16 | 9 | PB-168 659 |
| NAVWEPS-17-20AW-28 | 9 | PB-168 670 |
| NAVWEPS-17-20AW-34 | 9 | PB-168 669 |
| NAVWEPS-17-20AW-37 | 9 | PB-168 695 |
| NAVWEPS-17-20AX-04 | 9 | PB-168 584 |
| NAVWEPS-17-20AZ-18 | 9 | PB-168 662 |
| NAVWEPS-17-20AZ-24 | 9 | PB-168 693 |
| NAVWEPS-17-20BCK-1 | 9 | PB-168 601 |
| NAVWEPS-17-20BCK-2 | 9 | PB-168 653 |
| NAVWEPS-17-20BCK-6 | 9 | PB-168 600 |
| NAVWEPS-17-20GA-05 | 9 | PB-168 658 |
| NAVWEPS-17-20GF-15 | 9 | PB-168 698 |
| NAVWEPS-17-20GG-21 | 9 | PB-168 781 |
| NAVWEPS-17-20GG-22 | 9 | PB-168 778 |
| NAVWEPS-17-20GQ-12 | 9 | PB-168 701 |
| NAVWEPS-17-20GW-03 | 9 | PB-168 663 |
| NAVWEPS-17-20MD-05 | 14 | PB-168 697 |
| NAVWEPS-17-20QAB-1 | 5 | PB-168 668 |
| NAVWEPS-17-20QAB-3 | 9 | PB-168 699 |
| NAVWEPS-17-20SV-01 | 14 | PB-168 848 |
| NEL-1284 | 17 | AD-465 366 |
| NEL-1286 | 9 | AD-465 367 |
| NEL-1287 | 9 | AD-465 856 |
| NESCO-SN-183-2A | 8 | PB-168 845 |
| NHRP-26 | 4 | PB-168 380 |
| NHRP-37 | 4 | PB-168 388 |
| NHRP-8 | 4 | PB-168 363 |
| NWL-1923 | 11 | AD-443 654 |
| N63-19886 | 11 | AD-466 120 |
| N64-29650 | 5 | AD-442 707 |
| N65-10466 | 5 | AD-450 472 |
| ODY-TR-65-229 | 19 | AD-465 987 |
| OTR-131 | 11 | OTR-131 |
| OTR-132 | 11 | OTR-132 |
| OTR-133 | 11 | OTR-133 |
| P-2764 | 5 | AD-413 102 |
| PAL-65-3 | 20 | PB-168 634 |
| PATENT-3215956 | 9 | PAT-3215956 |
| PATENT-3216120 | 21 | PAT-3216120 |
| PATENT-3216308 | 20 | PAT-3216308 |
| PATENT-3216321 | 16 | PAT-3216321 |
| PATENT-3216322 | 19 | PAT-3216322 |
| PATENT-3216544 | 19 | PAT-3216544 |
| PATENT-3216648 | 13 | PAT-3216648 |
| PATENT-3216919 | 7 | PAT-3216919 |
| PATENT-3216945 | 11 | PAT-3216945 |
| PATENT-3217003 | 11 | PAT-3217003 |
| PATENT-3217017 | 21 | PAT-3217017 |
| PATENT-3217046 | 7 | PAT-3217046 |
| PATENT-3217099 | 20 | PAT-3217099 |
| PATENT-3217132 | 13 | PAT-3217132 |
| PATENT-3217146 | 17 | PAT-3217146 |
| PATENT-3217180 | 9 | PAT-3217180 |
| PATENT-3217187 | 9 | PAT-3217187 |
| PATENT-3217199 | 10 | PAT-3217199 |
| PATENT-3217247 | 9 | PAT-3217247 |
| PATENT-3217320 | 17 | PAT-3217320 |
| PATENT-3217322 | 17 | PAT-3217322 |
| PATENT-3217326 | 17 | PAT-3217326 |
| PATENT-3217421 | 6 | PAT-3217421 |
| PATENT-3217471 | 18 | PAT-3217471 |
| PATENT-3217488 | 21 | PAT-3217488 |
| PATENT-3217587 | 19 | PAT-3217587 |
| PATENT-3217591 | 20 | PAT-3217591 |
| PATENT-3217596 | 20 | PAT-3217596 |
| PATENT-3217599 | 16 | PAT-3217599 |
| PATENT-3217601 | 19 | PAT-3217601 |
| PATENT-3217649 | 16 | PAT-3217649 |
| PATENT-3217650 | 19 | PAT-3217650 |
| PATENT-3217651 | 21 | PAT-3217651 |
| PATENT-3217900 | 16 | PAT-3217900 |
| PATENT-3218007 | 1 | PAT-3218007 |
| PATENT-3218235 | 20 | PAT-3218235 |
| PATENT-3218475 | 6 | PAT-3218475 |
| PATENT-3218535 | 13 | PAT-3218535 |
| PATENT-3218578 | 9 | PAT-3218578 |
| PATENT-3218581 | 9 | PAT-3218581 |
| PATENT-3218585 | 9 | PAT-3218585 |
| PATENT-3218643 | 9 | PAT-3218643 |
| PB-168 363 | 4 | PB-168 363 |
| PB-168 380 | 4 | PB-168 380 |
| PB-168 388 | 4 | PB-168 388 |
| PB-168 554 | 16 | PB-168 554 |
| PB-168 563 | 20 | PB-168 563 |
| PB-168 579 | 6 | PB-168 579 |
| PB-168 582 | 9 | PB-168 582 |
| PB-168 584 | 9 | PB-168 584 |
| PB-168 590 | 4 | PB-168 590 |
| PB-168 592 | 5 | PB-168 592 |
| PB-168 593 | 5 | PB-168 593 |
| PB-168 596 | 5 | PB-168 596 |
| PB-168 597 | 6 | PB-168 597 |
| PB-168 600 | 9 | PB-168 600 |
| PB-168 601 | 9 | PB-168 601 |
| PB-168 602 | 17 | PB-168 602 |
| PB-168 604 | 4 | PB-168 604 |
| PB-168 605 | 5 | PB-168 605 |
| PB-168 608 | 4 | PB-168 608 |
| PB-168 611 | 9 | PB-168 611 |
| PB-168 614 | 5 | PB-168 614 |
| PB-168 615 | 9 | PB-168 615 |
| PB-168 634 | 20 | PB-168 634 |
| PB-168 649 | 11 | PB-168 649 |
| PB-168 650 | 11 | PB-168 650 |
| PB-168 651 | 11 | PB-168 651 |
| PB-168 652 | 11 | PB-168 652 |
| PB-168 653 | 11 | PB-168 653 |
| PB-168 654 | 11 | PB-168 654 |
| PB-168 655 | 11 | PB-168 655 |
| PB-168 656 | 11 | PB-168 656 |
| PB-168 658 | 9 | PB-168 658 |
| PB-168 659 | 9 | PB-168 659 |
| PB-168 660 | 9 | PB-168 660 |
| PB-168 661 | 9 | PB-168 661 |
| PB-168 662 | 9 | PB-168 662 |
| PB-168 663 | 9 | PB-168 663 |
| PB-168 668 | 5 | PB-168 668 |
| PB-168 669 | 9 | PB-168 669 |
| PB-168 670 | 9 | PB-168 670 |
| PB-168 671 | 9 | PB-168 671 |
| PB-168 672 | 16 | PB-168 672 |
| PB-168 673 | 11 | PB-168 673 |
| PB-168 675 | 9 | PB-168 675 |
| PB-168 676 | 21 | PB-168 676 |
| PB-168 683 | 5 | PB-168 683 |
| PB-168 686 | 5 | PB-168 686 |
| PB-168 687 | 11 | PB-168 687 |
| PB-168 688 | 11 | PB-168 688 |
| PB-168 689 | 4 | PB-168 689 |

| ACCESSION/REPORT NO. | FLD | ACCESS. NO. |
|---|---|---|
| PB-168 691 | 13 | PB-168 691 |
| PB-168 693 | 9 | PB-168 693 |
| PB-168 694 | 9 | PB-168 694 |
| PB-168 695 | 9 | PB-168 695 |
| PB-168 696 | 9 | PB-168 696 |
| PB-168 697 | 14 | PB-168 697 |
| PB-168 698 | 9 | PB-168 698 |
| PB-168 699 | 9 | PB-168 699 |
| PB-168 700 | 9 | PB-168 700 |
| PB-168 701 | 9 | PB-168 701 |
| PB-168 710 | 20 | PB-168 710 |
| PB-168 712 | 13 | PB-168 712 |
| PB-168 713 | 13 | PB-168 713 |
| PB-168 714 | 8 | PB-168 714 |
| PB-168 715 | 13 | PB-168 715 |
| PB-168 716 | 13 | PB-168 716 |
| PB-168 717 | 13 | PB-168 717 |
| PB-168 718 | 13 | PB-168 718 |
| PB-168 719 | 13 | PB-168 719 |
| PB-168 720 | 13 | PB-168 720 |
| PB-168 721 | 13 | PB-168 721 |
| PB-168 722 | 13 | PB-168 722 |
| PB-168 723 | 13 | PB-168 723 |
| PB-168 727 | 8 | PB-168 727 |
| PB-168 729 | 12 | PB-168 729 |
| PB-168 730 | 13 | PB-168 730 |
| PB-168 731 | 13 | PB-168 731 |
| PB-168 733 | 13 | PB-168 733 |
| PB-168 734 | 13 | PB-168 734 |
| PB-168 735 | 13 | PB-168 735 |
| PB-168 736 | 13 | PB-168 736 |
| PB-168 737 | 20 | PB-168 737 |
| PB-168 738 | 13 | PB-168 738 |
| PB-168 739 | 13 | PB-168 739 |
| PB-168 740 | 13 | PB-168 740 |
| PB-168 741 | 13 | PB-168 741 |
| PB-168 742 | 13 | PB-168 742 |
| PB-168 743 | 13 | PB-168 743 |
| PB-168 744 | 13 | PB-168 744 |
| PB-168 746 | 13 | PB-168 746 |
| PB-168 751 | 18 | PB-168 751 |
| PB-168 752 | 21 | PB-168 752 |
| PB-168 753 | 17 | PB-168 753 |
| PB-168 755 | 5 | PB-168 755 |
| PB-168 756 | 9 | PB-168 756 |
| PB-168 757 | 5 | PB-168 757 |
| PB-168 758 | 5 | PB-168 758 |
| PB-168 759 | 9 | PB-168 759 |
| PB-168 760 | 5 | PB-168 760 |
| PB-168 761 | 11 | PB-168 761 |
| PB-168 762 | 13 | PB-168 744 |
| PB-168 763 | 4 | PB-168 763 |
| PB-168 764 | 1 | PB-168 764 |
| PB-168 765 | 21 | PB-168 765 |
| PB-168 766 | 6 | PB-168 766 |
| PB-168 767 | 20 | PB-168 767 |
| PB-168 768 | 20 | PB-168 768 |
| PB-168 769 | 20 | PB-168 769 |
| PB-168 770 | 20 | PB-168 770 |
| PB-168 772 | 11 | PB-168 772 |
| PB-168 773 | 20 | PB-168 773 |
| PB-168 774 | 7 | PB-168 774 |
| PB-168 775 | 20 | PB-168 775 |
| PB-168 777 | 6 | PB-168 777 |
| PB-168 778 | 9 | PB-168 778 |
| PB-168 779 | 14 | PB-168 779 |
| PB-168 780 | 9 | PB-168 780 |
| PB-168 781 | 9 | PB-168 781 |
| PB-168 801 | 8 | PB-168 801 |
| PB-168 802 | 8 | PB-168 802 |
| PB-168 803 | 8 | PB-168 803 |
| PB-168 804 | 8 | PB-168 804 |
| PB-168 805 | 8 | PB-168 805 |
| PB-168 806 | 8 | PB-168 806 |
| PB-168 807 | 8 | PB-168 807 |
| PB-168 808 | 8 | PB-168 808 |
| PB-168 809 | 8 | PB-168 809 |
| PB-168 810 | 8 | PB-168 810 |
| PB-168 811 | 8 | PB-168 811 |
| PB-168 812 | 11 | PB-168 812 |
| PB-168 813 | 11 | PB-168 813 |
| PB-168 814 | 11 | PB-168 814 |
| PB-168 815 | 11 | PB-168 815 |
| PB-168 816 | 11 | PB-168 816 |
| PB-168 817 | 11 | PB-168 817 |
| PB-168 818 | 8 | PB-168 818 |
| PB-168 819 | 8 | PB-168 819 |
| PB-168 820 | 8 | PB-168 820 |
| PB-168 821 | 8 | PB-168 821 |
| PB-168 822 | 8 | PB-168 822 |
| PB-168 823 | 8 | PB-168 823 |
| PB-168 824 | 8 | PB-168 824 |
| PB-168 825 | 8 | PB-168 825 |
| PB-168 826 | 8 | PB-168 826 |
| PB-168 827 | 8 | PB-168 827 |
| PB-168 828 | 8 | PB-168 828 |
| PB-168 829 | 8 | PB-168 829 |
| PB-168 830 | 8 | PB-168 830 |
| PB-168 831 | 8 | PB-168 831 |
| PB-168 832 | 8 | PB-168 832 |
| PB-168 833 | 8 | PB-168 833 |
| PB-168 834 | 8 | PB-168 834 |
| PB-168 835 | 8 | PB-168 835 |
| PB-168 836 | 8 | PB-168 836 |
| PB-168 839 | 13 | PB-168 839 |
| PB-168 841 | 8 | PB-168 841 |
| PB-168 842 | 8 | PB-168 842 |
| PB-168 843 | 8 | PB-168 843 |
| PB-168 844 | 8 | PB-168 844 |
| PB-168 845 | 8 | PB-168 845 |
| PB-168 846 | 8 | PB-168 846 |
| PB-168 847 | 8 | PB-168 847 |
| PB-168 848 | 14 | PB-168 848 |
| PB-168 849 | 11 | PB-168 849 |
| PB-168 862 | 6 | PB-168 862 |
| PHS-PUB-999-WP-9 | 13 | PB-168 839 |
| QMCIAF-L-400-2 | 6 | PB-168 579 |
| R-147 | 11 | PB-168 849 |
| RADC-TN-60-187 | 17 | PB-168 753 |
| RCA DATA REDUCTION TR-41 | 16 | PB-168 672 |
| RDR-1343-4 | 11 | AD-421 884 |
| REPT. NO. 5 | 8 | AD-466 089 |
| REPT. NO. 6 | 8 | AD-466 206 |
| RG-TR-65-3 | 9 | AD-460 324 |
| RM-2108 | 18 | PB-168 751 |
| RM-2400 | 21 | PB-168 765 |
| RM-4620-ARPA | 1 | AD-472 659 |
| RM-77 | 5 | PB-168 605 |
| RMD-8576-Q1 | 11 | AD-466 120 |
| RR-65-3 | 5 | PB-168 592 |
| RSIC-328 | 14 | AD-457 110 |
| S-444 | 11 | AD-283 422 |
| S-532 | 11 | AD-407 959 |
| S-557 | 11 | AD-423 650 |
| S-586 | 11 | AD-424 626 |
| SA-TR20-2809 | 19 | AD-279 335 |
| SAWC-TDR-65-5 | 1 | AD-467 735 |
| SERIAL-15974 | 13 | AD-466 694 |
| SRM-65-5 | 5 | AD-466 192 |
| SRR-65-3 | 5 | AD-465 850 |
| SRR-65-4 | 5 | AD-465 851 |
| SSD-TR-65-77 | 14 | AD-465 897 |
| TDR-469(5111-01)-2 | 14 | AD-465 897 |
| TECHNICAL REPT. 3-630 | 8 | AD-466 089 |
| | 8 | AD-466 206 |
| TG-385 | 17 | PB-168 602 |
| TN-N-717 | 13 | AD-466 269 |
| TN-3-64 | 5 | AD-449 484 |
| TP-245 | 8 | PB-168 832 |
| TR-18 | 1 | PB-168 764 |
| TR-2-40 | 11 | AD-465 999 |
| TRENTON-RD-343-Q1 | 11 | AD-466 120 |
| USNEL-105 | 9 | PB-168 675 |
| WB-TN-14-NMRL-73 | 4 | PB-168 689 |
| WBTN-10-TDL-1 | 4 | PB-168 590 |
| WBTN-11-TDL-2 | 4 | PB-168 608 |
| 0528-01-2 | 10 | AD-278 480 |
| 0528-01-3 | 10 | AD-278 426 |
| 10 | 11 | AD-407 959 |
| 105-2 | 14 | AD-467 828 |
| 11 | 11 | AD-423 650 |
| 12 | 11 | AD-424 626 |
| 20-75 | 21 | PB-168 676 |
| 219 | 11 | AD-421 884 |
| 295-3(5) | 8 | PG-168 835 |
| 4P(Z)66918 | 11 | PB-168 673 |
| 621 | 6 | AD-466 946 |
| 627 | 6 | AD-466 947 |
| 628 | 6 | AD-466 948 |
| 7 | 11 | AD-283 422 |
| 8500-095-1780 | 8 | PB-168 847 |

FORM NBS-811 (2-65) U.S. DEPARTMENT OF COMMERCE NATIONAL BUREAU OF STANDARDS

# CLEARINGHOUSE ORDER FORM

SOLD TO *(Name or firm)*

TO: Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151

STREET ADDRESS

SHIP TO *(If different than sold to)*

CITY AND STATE *(Include zip code)* OR CITY AND COUNTRY

DEPOSIT ACCOUNT NO. *(If any)*

YOUR ORDER NO.

DATE

| ACCESSION/REPORT NUMBER OR TITLE | TYPE HC/ MF* | QUANTITY | UNIT PRICE | TOTAL PRICE | FOR CFSTI USE: ACTION CODE | VERIFIED BY | EXTRACTED BY | EXTRACTED DATE |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

IF ADDITIONAL SPACE IS NEEDED, PLEASE ATTACH ANOTHER ORDER FORM

PLEASE INDICATE METHOD OF CASH PAYMENT ☐ CHECK ☐ MONEY ORDER →

MAKE CHECK OR MONEY ORDER PAYABLE TO NATIONAL BUREAU OF STANDARDS - CFSTI

AMOUNT ENCLOSED

$

* Type of copy - **HC** stands for Hard Copy
**MF** stands for Microfiche

USCOMM-DC 26204-P65

U. S. GOVERNMENT PRINTING OFFICE : 1966 O - 799-65"

# U. S. DEPARTMENT OF COMMERCE FIELD OFFICES
## PROVIDE READY ACCESS TO COMMERCE SERVICES

• The Department of Commerce maintains Field Offices in the cities listed below for the purpose of providing ready access to the reports, publications, and services of the Business and Defense Services Administration, Bureau of International Commerce, Clearinghouse for Federal Scientific and Technical Information, Office of Business Economics, and the Bureau of the Census. Information on activities of the National Bureau of Standards, Patent Office, and the Area Redevelopment Administration is also available.

• Experienced personnel will gladly assist in the solution of specific problems, explain the scope and meaning of regulations administered by the Department, and provide practical assistance in the broad field of domestic and foreign commerce. Field offices act as official sales agents of the Superintendent of Documents and stock a wide range of official Government publications relating to business. Each office maintains an extensive business reference library containing periodicals, directories, publications, and reports from official as well as private sources.

### Department Field Offices

Albuquerque, N. Mex., 87101, U.S. Courthouse. 247-0311.
Anchorage, Alaska, 99501, 306 Loussac-Sogn Building. Phone: 272-6331.
Atlanta, Ga., 30303, 75 Forsyth Street, N.W. 526-6000.
Baltimore, Md., 21202, 305 U.S. Customhouse, Gay and Lombard Streets. Phone: PLaza 2-8460.
Birmingham, Ala., 35203, 505 Title Bldg., 2030 Third Avenue, North. Phone: 325-3131.
Boston, Mass., 02110, Room 230, 80 Federal Street. CApitol 3-2312.
Buffalo, N.Y., 14203, 504 Federal Building, 117 Ellicott Street. Phone: 842-3208.
Charleston, S.C., 29403, Federal Building, Suite 631, 334 Meeting Street. Phone: 747-4171.
Charleston, W. Va., 25301, 3002 New Federal Office Building, 500 Quarrier Street. Phone: 343-6196.
Cheyenne, Wyo., 82001, 6022 Federal Building, 2120 Capitol Avenue. Phone: 634-5920.
Chicago, Ill., 60604, 1486 New Federal Building, 219 South Dearborn Street. Phone: 828-4400.
Cincinnati, Ohio, 45202, 8028 Federal Office Building, 550 Main Street. Phone: 684-2944.
Cleveland, Ohio, 44101, 4th Floor, Federal Reserve Bank Bldg., East 6th St. & Superior Ave. Phone: 241-7900.
Dallas, Tex., 75202, Room 1200, 1114 Commerce Street. RIverside 9-3287.
Denver, Colo., 80202, 16407 Federal Building, 20th and Stout Street. Phone: 297-3246.
Des Moines, Iowa, 50309, 1216 Paramount Building, 509 Grand Avenue. Phone: 284-4222.
Detroit, Mich., 48226, 445 Federal Bldg. 226-6088.
Greensboro, N.C., 27402, 412 U.S. Post Office Building. Phone: 275-9111.
Hartford, Conn., 06103, 18 Asylum St. Phone: 244-3530.
Honolulu, Hawaii, 96813, 202 International Savings Bldg., 1022 Bethel Street. Phone: 588977.
Houston, Tex., 77002, 5102 Federal Bldg., 515 Rusk Ave. Phone: 228-0611.
Jacksonville, Fla., 32202, 512 Greenleaf Building, 208 Laura Street. Phone: 354-7111.
Kansas City, Mo., 64106, Room 2011, 911 Walnut Street. BAltimore 1-7000.
Los Angeles, Calif., 90015, Room 450, Western Pacific Building, 1031 S. Broadway. Phone: 688-2833.
Memphis, Tenn., 38103, 345 Federal Office Building, 167 North Main Street. Phone: 534-3214.
Miami, Fla., 33130, 1628 Federal Office Bldg., 51 S.W. First Avenue. Phone: 350-5267
Milwaukee, Wis., 53203, Straus Bldg., 238 W. Wisconsin Avenue. Phone: BR 2-8600.
Minneapolis, Minn., 55401, 306 Federal Building, 110 South Fourth Street. Phone: 334-2133.
New Orleans, La., 70130, 909 Federal Office Building (South), 610 South Street. Phone: 527-6546.
New York, N.Y., 10001, 61st Fl., Empire State Bldg., 350 Fifth Avenue. LOngacre 3-3377.
Philadelphia, Pa., 19107, Jefferson Building, 1015 Chestnut Street. Phone: 597-2850.
Phoenix, Ariz., 85025, 5413 New Federal Building, 230 N. First Avenue. Phone: 261-3285.
Pittsburgh, Pa., 15222, Room 2201, Federal Building, 1000 Liberty Avenue. Phone: 644-2850.
Portland, Oreg., 97204, 217 Old U. S. Courthouse, 520 S. W. Morrison Street. Phone: 226-3361.
Reno, Nev., 89502, 2028 Federal Building, 300 Booth Street. Phone: 784-5203.
Richmond, Va., 23240, 2105 Federal Building, 400 North 8th Street. Phone: 649-3611.
St. Louis, Mo., 63103, 2511 Federal Building, 1520 Market Street. MAin 2-4243.
Salt Lake City, Utah, 84111, 3235 Federal Building, 125 South State Street. Phone: 524-5116.
San Francisco, Calif., 94102, Federal Building, Box 36013. 450 Golden Gate Avenue. Phone: 556-5864.
Santurce, Puerto Rico, 00907, Room 628, 605 Condado Avenue. Phone: 723-4640.
Savannah, Ga., 31402, 235 U. S. Courthouse and Post Office Bldg., 125-29 Bull Street. Phone: 232-4321.
Seattle, Wash., 98104, 809 Federal Office Bldg., 909 First Avenue. 583-5615.

### FEDERAL REGIONAL TECHNICAL REPORT CENTERS

**Each of the Federal Regional Technical Report Centers listed below contains a collection of USAEC, NASA, and DOD unclassified reports as well as reports of other U. S. Government agencies and provides reference, interlibrary loan, and reproduction services.**

**Carnegie Library of Pittsburgh**
**4400 Forbes St.**
**Pittsburgh, Pa. 15213**

**Columbia University**
**Engineering Library**
**Seeley W. Mudd Building**
**New York, N. Y. 10027**

**Georgia Institute of Technology**
**Price Gilbert Library**
**Atlanta, Ga. 30300**

**The John Crerar Library**
**35 West 33rd St.**
**Chicago, Ill. 60616**

**Library of Congress**
**Science and Technology Division**
**Washington, D. C. 20540**

**Linda Hall Library**
**5109 Cherry Street**
**Kansas City, Mo. 64100**

**Massachusetts Institute of Technology**
**M. I. T. Libraries**
**Cambridge, Mass. 02139**

**Southern Methodist University**
**Science Library**
**P. O. Box 1339**
**Dallas, Tex. 75222**

**University of California**
**General Library**
**Berkeley, Calif. 94704**

**University of Colorado**
**Boulder, Colo. 80301**

**University of Washington Library**
**Government Documents Center**
**Seattle, Wash. 98105**

UNITED STATES
GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D.C. 20402

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U.S. GOVERNMENT PRINTING OFFICE

MIAMI UNIVERSITY LIBRARY